Vol. 930 Number 2

OFFICIAL GAZETTE

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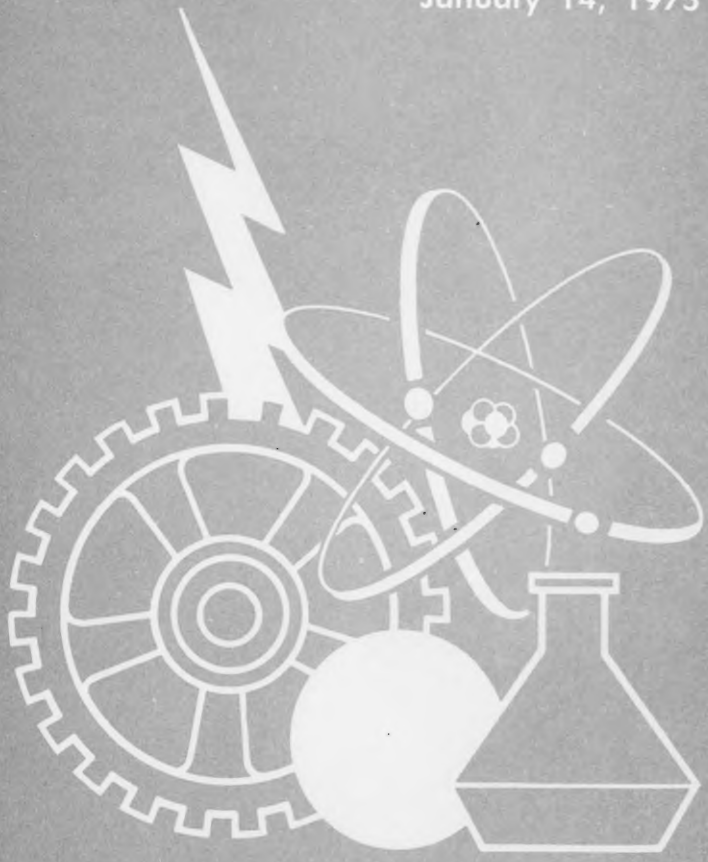
A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

January 14, 1975



U. S. DEPARTMENT OF COMMERCE

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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

January 14, 1975 Volume 930 Number 2

AMOCO OIL CO.

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PATENT OFFICE NOTICES

Publication of Applications Under Trial Voluntary Protest Program

The January 28, 1975 issue of the Official Gazette will include publication of information identifying the 665 applications in which secrecy was waived under the Trial Voluntary Protest Program announced by the Notice of May 7, 1974, published at 923 O.G. 2 on June 4, 1974. The identifying information will include matter similar to that used in the Official Gazette for patents and will also list the references cited by the Patent Office and the number of the examining group in which the application was examined.

From January 28, 1975 to April 28, 1975 the application files of the applications listed in the Official Gazette will be made available for public inspection upon written request in the examining group identified.

Applications in which secrecy has been waived under the Trial Voluntary Protest Program will be published in printed form, similar to that of printed patents. Printed copies will be available on and after January 28, 1975 at the prices set by statute for patent copies. Orders for copies of the published applications must include the "B" prefix before the Serial Number to differentiate them from orders for patents.

Orders for copies of the January 28, 1975 Official Gazette may be placed with the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The price is $6.60 per copy.

Any protests relating to the patentability of these published applications must be filed in writing in the Patent Office no later than April 28, 1975.

C. MARSHALL DANN,
Dec. 2, 1974 *Commissioner of Patents.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,129,332, D. Mastini, TELEPHONE SYSTEM, **filed** Nov. 20, 1962, D.C. Md. (Baltimore), Doc. 14214–C, *Domenico Mastini* v. *Raytheon Company.* Order of Court dismissing action, July 16, 1974.

2,713,686, Oster and Marconi, PIPED OR BOUND BUTTONHOLES IN GARMENTS AND METHOD OF MAKING THE SAME, **filed** Aug. 8, 1968, D.C., S.D.N.Y., Doc. 68–C–3216, *Finest Buttonholes, Inc.* v. *Regent Buttonhole Co. et ano.* Filed order dismissing action for lack of prosecution without prejudice, Oct. 12, 1972.

2,729,551, C. C. Cohn, SURFACE TREATMENT OF ALUMINUM AND ITS ALLOYS, **filed** Jan. 10, 1974, D.C. Del. (Wilmington), Doc. C.A. 74–4, *Colonial Alloys Company* v. *Textron Inc.* Notice of dismissal, action is dismissed with prejudice, Apr. 15, 1974. **Same, filed** July 12, 1974, D.C., N.D. Ill. (Freeport), Doc. 74c43, *Charles C. Cohn in his own right and as executor of the estate of Samuel L. Cohn, trading as Colonial Alloys Co.* v. *Lawrence Brothers, Inc.*

2,742,378, T. A. Te Grotenhuis, FILLERS HAVING VINYL SILOXANE GROUPS BONDED TO THE SURFACE THEREOF AND COPOLYMERS THEREOF WITH ETHYLENICALLY UNSATURATED POLYMERIZABLE MONOMERS, **filed** in the U.S. Court of Appeals, Ohio (Cincinnati), Doc. 74–1016, *Westwood Chemical, Inc.* v. *Molded Fiber Glass Body Company.* Decision affirmed, June 27, 1974.

2,767,113, G. C. Bower, PLANT-TIES AND METHOD OF MANUFACTURE, **filed** Apr. 24, 1968, D.C., C.D. Calif. (Los Angeles), Doc. 68–667–S, *St. Regis Paper Co.* v. *Royal Industries et al.* Filed judgment and order thereon that said patent is invalid and unenforceable. Defendants counterclaims are dismissed, entered July 22, 1974.

2,808,618, L. E. Soderquist, PRESS FOR SHAPING AND VULCANIZING PNEUMATIC TIRES, **filed** July 12, 1974, D.C., N.D. Ohio (Cleveland), Doc. C74–625, *McNeill Corporation* v. *NRM Corporation.*

2,854,991, M. E. Webster, PRESSURE REGULATOR VALVE, **filed** May 14, 1973, D.C., S.D.N.Y., Doc. 73–2126, *Bernzomatic Corp.* v. *Olin Corporation.* Filed Stipulation of discontinuance, Nov. 11, 1973.

2,857,752, Anderson, Dell and Nelson, FLASH LAMP; **2,982,119**, *R. M. Anderson, same;* **3,016,727**, Vanden Boom and Anderson, same; **3,064,457**, Vanden Boom and Jakubs, MULTI-LAMP UNIT; **3,123,993**, Cressman and Demchock, FLASH LAMP, **filed** Mar. 3, 1969, D.C., S.D.N.Y., Doc. 69–C–843, *General Electric Company* v. *Joseph Mendlovits et al.* Filed final judgment, defendants' counterclaim is dismissed without prejudice, Oct. 7, 1970.

2,944,917, A. Cahne, METHOD OF COATING A METAL BASE WITH POLYTETRAFLUOROETHYLENE; **3,008,601**, same, POLYTETRAFLUOROETHYLENE COATED COOKING UTENSILS, **filed** July 31, 1973, D.C. Md. (Baltimore), Doc. 73–769–HM, *T-Fal Corporation* v. *Tefal, S.A.* Motion of defendant to dismiss granted by the Court, and judgment was entered in favor of the defendant against the plaintiff, July 25, 1974.

2,994,880, C. P. Willis, UPHOLSTERER'S PNEUMATIC TACK DRIVING HAMMER; **3,283,985**, same, UPHOLSTERER'S PNEUMATIC TACK HAMMER DEVICE AND CONTINUOUS TACK FEEDER COMBINATION; **3,305,155**, same, ESCAPEMENT MECHANISM, **filed** July 11, 1974, D.C., M.D.N.C. (Greensboro), Doc. C–74–203–G, *Willis Industries, Inc. and Clyde P. Willis* v. *William Bencini.*

2,982,119. (See 2,857,752.)

3,008,601. (See 2,944,917.)

3,012,423, T. C. Lyster, MACHINE FOR KNITTING PATTERNED FABRICS, **filed** Dec. 4, 1969, D.C., S D.N.Y., Doc. 69–5382, *North American Rockwell Corporation* v. *The Singer Co.* Filed consent order of dismissal, June 15, 1970.

3,016,727. (See 2,857,752.)

3,021,871, F. J. Rodgers, HOSE FOR PORTABLE PNEUMATIC EQUIPMENT, **filed** Aug. 29, 1973, D.C.N.J. (Newark), Doc. C–1254–73, *Coilhose Pneumatics* v. *Samuel Moore & Company et al.* Stipulation and order of dismissal of action without costs, July 18, 1974.

3,064,457. (See 2,857,752.)

3,106,640, W. H. Oldendorf, RADIANT ENERGY APPARATUS FOR INVESTIGATING SELECTED AREAS OF THE INTERIOR OF OBJECTS OBSCURED BY DENSE MATERIAL, **filed** July 8, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV–74–1882, *EMI Limited* v. *William H. Oldendorf.*

3,108,409, O. Hendrickson, PNEUMATIC FILING MACHINE; **3,274,895**, same, DOUBLE PISTON PNEUMATIC FILING MACHINE; **3,399,494**, same, AIR OPERATED SANDING MACHINE, **filed** May 21, 1974, D.C., C.D. Calif. (Los Angeles), Doc. 74–1407–HP, *Allan Air Products, Inc.* v. *Chicago Pneumatic Tool Co.* **Same, filed** May 21, 1974, D.C., C.D. Calif. (Los Angeles), Doc. 74–1408–HP, *Allan Air Products, Inc.* v. *Snap-On Tools Corp.*

3,122,483, M. W. Rosenthal, STRONTIUM ION TOOTHPASTE, **filed** Dec. 10, 1971, D.C., S.D.N.Y., Doc. 71–C–5404, *Block Drug Company, Inc.* v. *Global Imports, Inc.* Filed consent judgment, Mar. 16, 1972.

3,122,610, A. Csicsatka, CIRCUITRY FOR MULTIPLEX TRANSMISSION OF FM STEREO SIGNALS WITH PILOT SIGNAL, **filed** Apr. 15, 1971, D.C., S.D.N.Y., Doc. 71–C–1687, *General Electric Company* v. *The Magnavox Company, Inc.* Filed stipulation and order that action be dismissed without prejudice, Jan. 2, 1974.

3,123,993. (See 2,857,752.)

3,128,693, F. V. Thiemann, HIGH SPEED PRINTER DRUM, **filed** May 13, 1969, D.C., S.D.N.Y., Doc. 69–C–2061, *Potter*

Instrument Company Inc. v. *Mohawk Data Sciences Corporation.* Filed stipulation of dismissal with prejudice, Nov. 28, 1972.

3,274,895. (See 3,108,409.)

3,283,985. (See 2,994,880.)

3,305,155. (See 2,994,880.)

3,399,494. (See 3,108,409.)

3,509,484, P. Basse, DIGITAL FREQUENCY COUNTING AND DISPLAY APPARATUS FOR TUNABLE WIDE BAND GENERATORS, filed Mar. 17, 1972, D.C., S.D.N.Y., Doc. 72–C–1139, *Logimetrics, Inc.* v. *The Singer Company.* Filed stipulation and order of dismissal, Feb. 1, 1973.

3,743,809, A. F. Delpaggio, METHOD AND APPARATUS FOR INDUCTIVELY HEATING VALVE SEATS, filed May 7, 1974, D.C., E.D. Mich. (Detroit), Doc. 74–71599, *Park-Ohio Industries, Inc.* v. *Trim Tool Engineering, Inc. et al.*

Certificates of Correction for the Week of Jan. 14, 1975

P.P. 3,624	3,793,638	3,836,715	3,843,958
Re. 28,117	3,798,849	3,836,757	3,844,033
Re. 28,228	3,803,199	3,837,255	3,844,061
D. 227,602.	3,803,827	3,837,401	3,844,063
D. 233,318	3,805,792	3,837,853	3,844,085
3,330,727	3,809,312	3,838,103	3,844,142
3,560,569	3,810,918	3,838,131	3,844,339
3,562,462	3,811,192	3,838,619	3,844,351
3,587,845	3,811,645	3,838,698	3,844,390
3,594,210	3,812,365	3,839,259	3,844,485
3,631,252	3,813,086	3,839,362	3,844,497
3,632,473	3,813,382	3,839,723	3,844,504
3,646,093	3,815,540	3,840,055	3,844,651
3,656,516	3,816,144	3,840,086	3,844,652
3,664,916	3,816,328	3,840,128	3,844,797
3,668,302	3,817,715	3,840,575	3,844,906
3,673,595	3,817,743	3,840,670	3,844,948
3,681,202	3,818,009	3,840,690	3,845,044
3,687,961	3,818,010	3,840,727	3,845,046
3,688,015	3,818,202	3,840,826	3,845,147
3,694,493	3,818,721	3,840,841	3,845,231
3,695,823	3,819,446	3,840,915	3,845,519
3,703,450	3,820,603	3,841,084	3,845,554
3,705,874	3,820,768	3,841,102	3,845,598
3,712,793	3,822,247	3,841,231	3,845,672
3,717,336	3,823,493	3,841,357	3,845,739
3,732,814	3,824,231	3,841,498	3,845,910
3,740,185	3,824,314	3,841,530	3,845,955
3,742,445	3,825,362	3,841,559	3,846,126
3,747,886	3,826,076	3,841,620	3,846,131
3,747,889	3,826,286	3,841,772	3,846,417
3,755,304	3,827,370	3,842,004	3,846,457
3,756,388	3,828,400	3,842,099	3,846,582
3,764,354	3,829,226	3,842,280	3,846,908
3,765,496	3,829,277	3,842,567	3,847,199
3,765,944	3,829,566	3,842,605	3,847,223
3,769,282	3,830,385	3,842,624	3,847,707
3,770,104	3,831,417	3,842,810	3,847,708
3,770,754	3,831,434	3,843,055	3,847,842
3,772,071	3,832,058	3,843,273	3,847,850
3,781,072	3,833,396	3,843,336	3,847,853
3,787,108	3,833,889	3,843,346	3,848,180
3,787,578	3,834,268	3,843,380	3,848,422
3,788,221	3,834,544	3,843,415	3,848,427
3,788,313	3,834,850	3,843,440	3,848,460
3,788,746	3,834,924	3,843,510	3,848,502
3,789,036	3,835,026	3,843,609	3,848,960
3,790,095	3,835,931	3,843,722	3,849,146
3,791,666	3,836,046	3,843,785	3,849,355
3,792,050	3,836,311	3,843,940	3,849,687
3,793,062	3,836,539	3,843,945	3,850,425

Disclaimer

3,652,835.—*Bernard T. Devlin* and *William F. Poland*, Phoenix, Ariz. AIRCRAFT GLIDE SLOPE COUPLER SYSTEM. Patent dated Mar. 28, 1972. Disclaimer filed Sept. 27, 1974, by the assignee, *Sperry Rand Corporation*.

Hereby enters this disclaimer to claims 1, 8, 10, 13 and 14 of said patent.

National Technical Information Service

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Copies of patent applications, either paper copy (PC) or microfiche (MF), can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161, at the prices cited. Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent Office. Claims and other technical data can usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information should be directed to the address cited below for each agency.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. ATOMIC ENERGY COMMISSION
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 474,549. Improved Thermal Battery. Filed May 30, 1974. PC $3.25/MF $2.25.

Patent 3,801,358. Refuse and Sewage Polymer Impregnated Concrete. Filed May 22, 1972. Patented Apr. 2, 1974. Not available NTIS.

Patent 3,801,484. Fixation of Nitrogen to Form Nitrates. Filed Oct. 13, 1972. Patented Apr. 2, 1974. Not available NTIS.

Patent 3,801,700. Preparation of (238) Pu (16)02. Filed Mar. 28, 1972. Patented Apr. 2, 1974. Not available NTIS.

Patent 3,803,295. Method for Removing Iodine From Nitric Acid. Filed Dec. 21, 1972. Patented Apr. 9, 1974. Not available NTIS.

Patent 3,804,940. Method of Separating Thorium From Yttrium and Lanthanide Rare Earths. Filed Oct. 26, 1972. Patented Apr. 16, 1974. Not available NTIS.

Patent 3,806,248. Continuous Flow Condensation Nuclei Counter. Filed Feb. 21, 1973. Patented Apr. 23, 1974. Not available NTIS.

Patent 3,808,097. Production of Fluorine-18 Labeled 5-Fluorouracil. Filed Nov. 28, 1972. Patented Apr. 30, 1974. Not available NTIS.

Patent 3,809,731. Method of Fabricating a Nuclear Reactor Fuel Element. Filed Mar. 30, 1961. Patented May 7, 1974. Not available NTIS.

Patent 3,810,962. Method of Making a Carbide-Graphite Composite Nuclear Fuel. Filed Aug. 25, 1972. Patented May 14, 1974. Not available NTIS.

Patent 3,811,426. Method and Apparatus for the In-Vessel Radiation Treatment of Blood. Filed May 21, 1973. Patented May 21, 1974. Not available NTIS.

Patent 3,814,355. Destructible Parachute. Filed Aug. 1, 1973. Patented June 4, 1974. Not available NTIS.

Patent 3,815,868. Gate Valve. Filed June 6, 1973. Patented June 11, 1974. Not available NTIS.

Patent 3,820,038. Method and Apparatus for Producing Isolated Laser Pulses Having a Fast Rise Time. Filed Feb. 9, 1973. Patented June 25, 1974. Not available NTIS.

Patent 3,820,144. Electromechanical Shutter. Filed Oct. 1, 1973. Patented June 25, 1974. Not available NTIS.

Patent 3,820,435. Confinement System for High Explosive Events. Filed May 11, 1972. Patented June 28, 1974. Not available NTIS.

Patent 3,821,356. Production of High Purity Halides. Filed Mar. 8, 1973. Patented June 28, 1974. Not available NTIS.

U.S. DEPARTMENT OF AIR FORCE AF/JACP
Washington, D.C. 20314

Patent application 478,551. Aircraft/Spacecraft Ground Accelerator. Filed June 12, 1974. PC $3.25/MF $2.25.

Patent application 478,553. Liquid Cooled Runway. Filed June 12, 1974. PC $3.25/MF $2.25.

Patent application 478,810. Fragment Suppression Configuration. Filed June 12, 1974. PC $23.25/MF $2.25.

Patent 3,794,473. Rare Earth Beta-Ketoenolate Anti-Knock Additives in Gasoline. Filed Sept. 20, 1972. Patented Feb. 26, 1974. Not available NTIS.

Patent 3,798,648. High Resolution Airborne Signal Processing System. Filed June 27, 1972. Patented Mar. 19, 1974. Not available NTIS.

Patent 3,803,394. Centroid Tracker. Filed Feb. 14, 1973. Patented Apr. 9, 1974. Not available NTIS.

Patent 3,807,169. Integral Precombustor/Ramburner Assembly. Filed June 13, 1973. Patented Apr. 30, 1974. Not available NTIS.

Patent 3,807,216. Temperature Cycling Device. Filed Sept. 15, 1972. Patented Apr. 30, 1974. Not available NTIS.

Patent 3,815,026. Radar Altimeters for Automatic Landing Systems. Filed Nov. 15, 1971. Patented June 4, 1974. Not available NTIS.

Patent 3,815,135. Direction Finding Interferometer for a Linear FM Signal. Filed Oct. 26, 1972. Patented June 4, 1974. Not available NTIS.

Patent 3,816,586. Method of Fabricating Boron Suboxide Articles. Filed Mar. 21, 1972. Patented June 11, 1974. Not available NTIS.

Patent 3,817,945. Curing System for Carboxy Terminated Polybutadiene Propellants. Filed Mar. 4, 1970. Patented June 18, 1974. Not available NTIS.

Patent 3,818,219. Non-Destructive Testing of Metal Structures by Measuring Exo-Electron Emission. Filed Apr. 18, 1972. Patented June 18, 1974. Not available NTIS.

Patent 3,822,792. Air Flotation Cargo Handling System. Filed Nov. 28, 1972. Patented July 9, 1974. Not available NTIS.

Patent 3,823,600. Pneumatic Linear Accelerator. Filed Apr. 9, 1973. Patented July 16, 1974. Not available NTIS.

Patent 3,823,668. Duplex Combustible Cartridge Case. Filed Oct. 19, 1972. Patented July 16, 1974. Not available NTIS.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Room W513, 401 M. St. SW., Washington, D.C. 20460

Patent 3,664,940. Suspension Dewatering Method. Filed Oct. 6, 1969. Patented May 23, 1972. Not available NTIS.

Patent 3,701,486. Snagging Device for Inverted Grinder. Filed Sept. 1, 1970. Patented Oct. 31, 1972. Not available NTIS.

Patent 3,803,920. Sample Dilution Device-Disc Diluter. Filed Nov. 15, 1972. Patented Apr. 16, 1974. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

National Institutes of Health, Chief, Patent Branch Westwood Building, Bethesda, Md. 20014

Patent application 509,966. Nuclease-Resistant Hydrophilic Complex of Polyriboinosinic-Polyribocytidylic Acid. Filed Sept. 27, 1974. PC $3.25/MF $2.25.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Sts. NW. Washington, D.C. 20240

Patent 3,767,782. Self-Destructing Pesticidal Formulations and Methods for Their Use. Filed Dec. 23, 1970. Patented Oct. 23, 1973. Not available NTIS.

DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research Code 302 Arlington, Va. 22217

Patent 3,727,570. Drag Reduction Method. Filed Jan. 20, 1970. Patented Apr. 17, 1973. Not available NTIS.

Patent 3,727,718. Surface Wave Ambiguity Analyzer. Filed Nov. 24, 1971. Patented Apr. 17, 1973. Not available NTIS.

Patent 3,727,863. Air-Venting Parachute. Filed June 23, 1971. Patented Apr. 17, 1973. Not available NTIS.

Patent 3,728,086. Method of Preparing Ammonium Perchlorate Crystals of Controlled Size. Filed Apr. 17, 1969. Patented Apr. 17, 1973. Not available NTIS.

Patent 3,728,169. Encapsulation of Nitronium Perchlorate Employing Ammonia to Form Ammonium Perchlorate. Filed Mar. 18, 1963. Patented Apr. 17, 1973. Not available NTIS.

Patent 3,728,170. Plastic-Bonded Explosive Compositions and the Preparation Thereof. Filed Sept. 6, 1962. Patented Apr. 17, 1973. Not available NTIS.

Patent 3,728,270. Chemiluminescent Formulation Containing Inorganic Salt Solution. Filed July 30, 1965. Patented Apr. 17, 1973. Not available NTIS.

Patent 3,728,271. Chemiluminescent Formulation. Filed Feb. 26, 1969. Patented Apr. 17, 1973. Not available NTIS.

Patent 3,728,525. Magnetic Navigation System. Filed Oct. 19, 1971. Patented Apr. 17, 1973. Not available NTIS.

Patent 3,728,636. Inverse Logarithmic Function Generator. Filed Dec. 28, 1971. Patented Apr. 17, 1973. Not available NTIS.

Patent 3,728,717. Digital to Time Interval Converter. Filed Dec. 27, 1971. Patented Apr. 17, 1973. Not available NTIS.

Patent 3,728,719. R-2R Resistive Ladder, Digital-to-Analog Converter. Filed Mar. 20, 1972. Patented Apr. 17, 1973. Not available NTIS.

Patent 3,728,734. Method of Resolving Multiple Sweep Ambiguities Encountered in High Resolution Graphic Recorders and the Like. Filed Apr. 23, 1971. Patented Apr. 17, 1973. Not available NTIS.

Patent 3,728,748. Mooring Apparatus. Filed Nov. 27, 1970. Patented Apr. 24, 1973. Not available NTIS.

Patent 3,729,350. Composition for Forming Cloud of Incapacitating Agent Upon Detonation. Filed Feb. 2, 1970. Patented Apr. 24, 1973. Not available NTIS.

Patent 3,729,351. Flare Composition Comprising Dry Blend of Metal Fuel and Eutectic Mixture of Oxidizer Salts. Filed Oct. 1, 1969. Patented Apr. 24, 1973. Not available NTIS.

Patent 3,729,425. Porous Chemiluminescent. Material and Method of Manufacture. Filed Apr. 29, 1969. Patented Apr. 24, 1973. Not available NTIS.

Patent 3,729,598. Earphone Receiver Attenuation Measurement Technique. Filed Nov. 11, 1971. Patented Apr. 24, 1973. Not available NTIS.

Patent 3,729,679. Suppressed Carrier Single-Sideband Signal Detection. Filed Aug. 30, 1971. Patented Apr. 24, 1973. Not available NTIS.

Patent 3,729,739. Instantaneous Frequency Diversity Radar System. Filed July 28, 1966. Patented Apr. 24, 1973. Not available NTIS.

Patent 3,729,742. Simultaneous Sum and Difference Pattern Technique for Circular Array Antennas. Filed Aug. 14, 1972. Patented Apr. 24, 1973. Not available NTIS.

Patent 3,729,829. Double Cantilever Split-Pin Displacement Gage. Filed Oct. 22, 1971. Patented May 1, 1973. Not available NTIS.

Patent 3,729,902. Carbon Dioxide Sorbent for Confined Breathing Atmospheres. Filed Apr. 21, 1971. Patented May 1, 1973. Not available NTIS.

Patent 3,729,980. Hydrodynamic Shock Simulator. Filed Mar. 2, 1972. Patented May 1, 1973. Not available NTIS.

Patent 3,730,099. Controlled Descent System. Filed Dec. 17, 1970. Patented May 1, 1973. Not available NTIS.

Patent 3,730,789. Monopropellant Composition Including Hydroxylamine Perchlorate. Filed July 8, 1969. Patented May 1, 1973. Not available NTIS.

Patent 3,731,075. Automatic Rate Tracker. Filed June 29, 1962. Patented May 1, 1973. Not available NTIS.

Patent 3,731,116. High Frequency Field Effect Transistor Switch. Filed Mar. 2, 1972. Patented May 1, 1973. Not available NTIS.

Patent 3,731,264. Apparatus for Determining the Position of a Surface Vessel With Respect to a Signal Source. Filed Jan. 24, 1972. Patented May 1, 1973. Not available NTIS.

Patent 3,731,304. Track-Before-Detect System. Filed Sept. 8, 1961. Patented May 1, 1973. Not available NTIS.

Patent 3,731,306. Sea State Analyzer Using Radar Sea Return. Filed Jan. 24, 1972. Patented May 1, 1973. Not available NTIS.

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Patent 3,731,743. Fire Control Apparatus Air Pollution Product Abatement. Filed Oct. 20, 1971. Patented May 8, 1973. Not available NTIS.

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Patent 3,732,626. Spline Wear Measurement Gage. Filed Jan. 22, 1969. Patented May 15, 1973. Not available NTIS.

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Patent 3,733,629. Buoyant Matrix Materials. Filed May 27, 1971. Patented May 22, 1973. Not available NTIS.

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Patent 3,734,788. High Density Solid Propellants and Methods of Preparation Using Fluoropolymers. Filed Apr. 17, 1964. Patented May 22, 1973. Not available NTIS.

Patent 3,737,605. Switch Seal. Filed Apr. 8, 1971. Patented June 5, 1973. Not available NTIS.

Patent 3,743,932. Clipped Correlation to Signal-to-Noise Ratio Meter. Filed Mar. 21, 1972. Patented July 3, 1973. Not available NTIS.

Patent 3,743,942. Compressive Scanning Receiver. Filed June 16, 1972. Patented July 3, 1973. Not available NTIS.

Patent 3,743,951. Voltage Controlled Up-Down Clock Rate Generator. Filed Apr. 26, 1972. Patented July 3, 1973. Not available NTIS.

Patent 3,743,961. Inclined Air Core Solenoid Fields for Lasers. Filed Feb. 9, 1972. Patented July 3, 1973. Not available NTIS.

Patent 3,743,995. Two Color Detector. Filed Mar. 14, 1972. Patented July 3, 1973. Not available NTIS.

Patent 3,744,014. SUS Cable Trolley. Filed Dec. 3, 1971. Patented July 3, 1973. Not available NTIS.

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Patent 3,744,718. Luminescent Aerosol Marker. Filed May 20, 1970. Patented July 10, 1973. Not available NTIS.

Patent 3,745,474. High Speed Logarithmic Video Amplifier. Filed Dec. 20, 1971. Patented July 10, 1973. Not available NTIS.

Patent 3,745,517. Distance Measuring Device and Method. Filed May 11, 1970. Patented July 10, 1973. Not available NTIS.

Patent 3,745,519. Small Craft Positioning System. Filed June 3, 1971. Patented July 10, 1973. Not available NTIS.

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Patent 3,745,579. Double Mixing Doppler Simulator. Filed Feb. 26, 1969. Patented July 10, 1973. Not available NTIS.

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Patent 3,745,775. Underwater in Situ Placement of Concrete. Filed Nov. 22, 1971. Patented July 17, 1973. Not available NTIS.

Patent 3,746,216. Fluid Mixer-Dispenser. Filed Sept. 10, 1971. Patented July 17, 1973. Not available NTIS.

Patent 3,746,454. Infrared Receiver for Optical Radar. Filed Mar. 3, 1971. Patented July 17, 1973. Not available NTIS.

Patent 3,746,782. Shrunken Raster With Image Insetting Filed Nov. 4, 1971. Patented July 17, 1973. Not available NTIS.

Patent 3,746,799. Method and Apparatus for Encoding and Decoding Analog Signals. Filed Sept. 27, 1971. Patented July 17, 1973. Not available NTIS.

Patent 3,746,920. Lightweight Xenon Lamp Igniter. Filed Nov. 24, 1971. Patented July 17, 1973. Not available NTIS.

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Patent 3,747,046. Receptacle for Large Scale Integrated Circuit (L.S.I.) Package. Filed Oct. 22, 1971. Patented July 17, 1973. Not available NTIS.

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Patent 3,747,528. Aircraft Parachute Flare Having Tapered Core Candle. Filed Feb. 25, 1972. Patented July 24, 1973. Not available NTIS.

Patent 3,747,877. Load Equalizing Sling. Filed Oct. 21, 1971. Patented July 24, 1973. Not available NTIS.

Patent 3,748,167. Method for Applying an Acoustic Barrier. Filed Aug. 9, 1971. Patented July 24, 1973. Not available NTIS.

Patent 3,748,374. Multi-Color Periscope View Simulator. Filed Feb. 7, 1972. Patented July 24, 1973. Not available NTIS.

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Patent 3,750,040. Transistor Delay Line Driver. Filed June 21, 1972. Patented July 31, 1973. Not available NTIS.

Patent 3,750,163. IFF-System. Filed Jan. 23, 1962. Patented July 31, 1973. Not available NTIS.

Patent 3,750,173. Frequency Translating Repeater (Boomerang) Using Single-Sideband Techniques. Filed July 29, 1970. Patented July 31, 1973. Not available NTIS.

Patent 3,750,243. Low Loss Electrical Conductive Coating and Bonding Materials Including Magnetic Particles for Mixing. Filed Dec. 16, 1968. Patented Aug. 7, 1973. Not available NTIS.

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Patent 3,751,900. Remote Time Transfer System With Epoch Pulse. Filed Apr. 23, 1971. Patented Aug. 14, 1973. Not available NTIS.

Patent 3,752,078. Dispenser Cargo Section. Filed Jan. 21, 1972. Patented Aug. 14, 1973. Not available NTIS.

Patent 3,752,591. Sextant With Digital Readout and Night Viewing Capability. Filed Aug. 4, 1971. Patented Aug. 14, 1973. Not available NTIS.

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Patent 3,753,215. Cable Connector. Filed Apr. 12, 1974. Patented Aug. 14, 1973. Not available NTIS.

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Patent 3,753,656. Gas Chromatograph. Filed Apr. 7, 1971. Patented Aug. 21, 1973. Not available NTIS.

Patent 3,754,121. Solid State Instrument System for Digital Counting and Continuously Indicating Count Results. Filed July 28, 1972. Patented Aug. 21, 1973. Not available NTIS.

Patent 3,754,142. High Frequency Lad Line Using Low Frequency Detectors. Filed Mar. 1, 1971. Patented Aug. 21, 1973. Not available NTIS.

Patent 3,754,257. Bi-Static Circularly Symmetric Retrodirective Antenna. Filed Feb. 25, 1972. Patented Aug. 21, 1973. Not available NTIS.

Patent 3,754,258. Linear or Planar Retrodirective Antenna System. Filed Feb. 25, 1972. Patented Aug. 21, 1973. Not available NTIS.

Patent 3,754,282. High Resolution Recorder. Filed Dec. 22, 1972. Patented Aug. 21, 1973. Not available NTIS.

Patent 3,754,596. Cooling System for Multiple Electrical Equipments. Filed Dec. 3, 1971. Patented Aug. 28, 1973. Not available NTIS.

Patent 3,755,698. Free-Flooded Ring Transducer With Slow Wave Guide. Filed Apr. 25, 1972. Patented Aug. 28, 1973. Not available NTIS.

Patent 3,755,731. System for Detecting Dropout and Noise Characteristics of Magnetic Tape With Switch Means to Select Which Characteristics To Be Detected. Filed Jan. 10, 1972. Patented Aug. 28, 1973. Not available NTIS.

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Patent 3,755,814. Precision Transponder System. Filed Feb. 8, 1971. Patented Aug. 28, 1973. Not available NTIS.

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Patent 3,771,484. Inflatable Floating Island. Filed Apr. 14, 1972. Patented Nov. 13, 1973. Not available NTIS.

Patent 3,771,880. Roughness Analyzer. Filed Sept. 29, 1971. Patented Nov. 13, 1973. Not available NTIS.

Patent 3,773,284. Controllable Multi-Stage Increasing Drag Parachute. Filed Feb. 25, 1972. Patented Nov. 20, 1973. Not available NTIS.

Patent 3,744,159. Apparatus and Method for Determining the Profile of an Underwater Target. Filed Nov. 24, 1972. Patented Nov. 20, 1973. Not available NTIS.

Patent 3,774,165. Apparatus for Processing the Flow of Digital Data. Filed Aug. 2, 1972. Patented Nov. 20, 1973. Not available NTIS.

Patent 3,774,207. Nadir Seeker Orientation of a Space Vehicle in Relation to the Planet Being Orbited. Filed Apr. 25, 1972. Patented Nov. 20, 1973. Not available NTIS.

Patent 3,774,540. Terradynamic Brake. Filed Dec. 1, 1971. Patented Nov. 27, 1973. Not available NTIS.

Patent 3,775,199. Nitrogen Generator. Filed Oct. 13, 1972. Patented Nov. 27, 1973. Not available NTIS.

Patent 3,775,268. Use of Lead in a Nonorganic-Containing Copper Pyrophosphate Bath. Filed Dec. 30, 1971. Patented Nov. 27, 1973. Not available NTIS.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters, NASA—Code GP–2, Washington, D.C. 20546

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Patent application 493,360. Field Sequential Stereo Television. Filed July 31, 1974. PC $3.25/MF $2.25.

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Patent application 502,138. An Optical Process for Producing Classification Maps From Multispectral Data. Filed Aug. 30, 1974. PC $3.75/MF $2.25.

Patent 3,830,094. Method and Device for Detection of Surface Discontinuities or Defects. Patented Aug. 20, 1974. Not available NTIS.

Patent 3,830,335. Noise Suppressor. Patented Aug. 20, 1974. Not available NTIS.

Patent 3,830,673. Preparing Oxidizer Coated Metal Fuel Particles. Patented Aug. 20, 1974. Not available NTIS.

Patent 3,831,117. Capacitance Multiplier and Filter Synthesizing Network. Patented Aug. 20, 1974. Not available NTIS.

Patent 3,832,764. Tool for use in Lifting Pin Supported Objects. Patented Sept. 3, 1974. Not available NTIS.

Patent 3,832,781. Measuring Probe Position Recorder. Patented Sept. 3, 1974. Not available NTIS.

PATENT EXAMINING CORPS

WILLIAM FELDMAN, Acting Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF DECEMBER 21, 1974

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions: Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock: Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-31-74
GENERAL ORGANIC CHEMISTRY, GROUP 120—R. F. BURNETT, Acting Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids, Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-1-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Fore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	12-19-73
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. L. LEAVITT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	6-12-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-28-74
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-15-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	7-2-73
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-2-74
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	5-15-74
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy: Measuring.	12-20-73
DESIGNS, GROUP 290—C D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-25-73
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-1-74
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools: Cutlery; Jacks.	3-14-74
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. PULFREY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-1-74
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	3-15-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	6-3-74

Expiration of patents: The patents within the range of numbers indicated below expire during November 1974, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,811,722 to 2,814,801, inclusive
Plant Patents..... Numbers 1,656 to 1,660, inclusive

REISSUE PATENTS

GRANTED JANUARY 14, 1975

ERRATA

For CLASS	See PATENT NO.
260-683	28,300
343-005	28,302

REISSUES

JANUARY 14, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

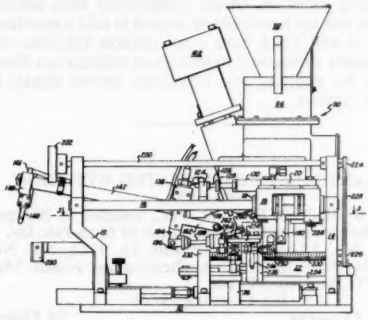
28,299
METHOD AND MECHANISM FOR APPLYING CEMENT IN THE CORNER BETWEEN AN UPPER MARGIN AND AN INSOLE

Jacob S. Kamborian, deceased, late of West Newton, Mass., by Lisbeth N. Godley, Washington, D.C., and Michael M. Becka and Jacob S. Kamborian, Jr., Nashua, N.H., executors, and Costa Caris, East Walpole, Mass.; said Caris assignor to the estate of said Jacob S. Kamborian

Original No. 3,758,904, dated Sept. 18, 1973, Ser. No. 325,701, Jan. 22, 1973. Application for reissue Nov. 8, 1973, Ser. No. 414,045

Int. Cl. A43d *21/00*; B05c *1/06*

U.S. Cl. 12—142 R **26 Claims**



1. A cement applying mechanism comprising: support means for supporting bottom-up a shoe assembly that includes a last having an insole located on its bottom and an upper mounted thereon, at least one end portion of the margin of the upper having been wiped against the insole and an unwiped portion of the upper margin extending rearwardly of said wiped end portion and extendingly upwardly of the corresponding portion of the insole periphery; a nozzle, located above the shoe assembly, mounted for forward-rearward movement; means for applying a yieldable downward force *and a yieldable outward force* to the nozzle *such as* to cause the nozzle to bear against the insole *in the corner between said unwiped upper margin portion and said corresponding portion of the insole periphery* rearwardly of *the boundary between said wiped and unwiped portions;* [said wiped end portion and spacedly from said unwiped portion of the upper margin and said corresponding portion of the insole periphery; means for thereafter applying a yieldable outward force to the nozzle, while the downward force is maintained, to cause the nozzle to move into the corner between said unwiped upper margin portion and said corresponding portion of the insole periphery rearwardly of the boundary between said wiped and unwiped portions;] means for thereafter moving the nozzle forwardly, while said downward and outward forces are maintained, until the nozzle arrives at said boundary; means for thereafter moving the nozzle rearwardly, while said downward and outward forces are maintained, and for concomitantly extruding cement through the nozzle, until the nozzle arrives at a desired location along said unwiped portion of the upper margin to thereby cause the cement to be extruded along the entire length of said unwiped portion of the upper margin between said boundary and said desired location into said corner; and means for thereafter [moveing] *moving* the nozzle inwardly of said corner and for raising the nozzle upwardly of the insole.

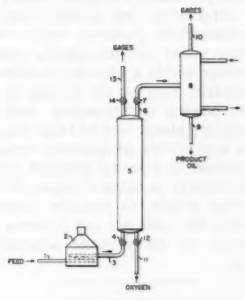
28,300
SELECTIVE CONVERSION OF NORMAL PARAFFINS

Roger M. Butler and Jackson Eng, Sarnia, Ontario, Canada, assignors to Esso Research and Engineering Company

Original No. 3,294,858, dated Dec. 27, 1966, Ser. No. 267,376, Feb. 28, 1963, which is a division of application Ser. No. 741,906, June 13, 1958. Application for reissue Oct. 16, 1972, Ser. No. 297,760, which is a continuation of abandoned reissue application Ser. No. 793,207, Dec. 26, 1968

Int. Cl. C07c *3/34*

U.S. Cl. 260—683 R **5 Claims**



1. An improved process for selectively removing normal paraffin hydrocarbons from a hydrocarbon oil boiling between about 100° and about 750° F. which comprises contacting said oil in vapor phase with a crystalline metallic alumino-silicate having uniform pore spaces of about 5 Angstrom units *in contact* [and concomitantly purging hydrocarbon fragments from the said pores of the crystalline metallic alumino-silicate] with a gas having a molecular diameter less than about 5 Angstrom units at a temperature of from about 800 to about 1000° F. in a contacting zone, said gas selected from the group consisting of hydrogen, nitrogen, carbon dioxide and inert gas, withdrawing oil vapor [containing olefins formed by the selective conversion of normal paraffins] from said zone, continuing said contacting until the vapor withdrawn has an undesirably high normal paraffins content [, and thereafter regenerating said metallic alumino-silicate by contact with an oxygen-containing gas at elevated temperature].

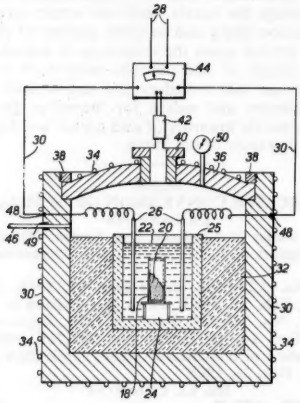
28,301
HOT ISOSTATIC PRESSING USING A VITREOUS CONTAINER

Charles J. Havel, 162 Proctor Blvd., Utica, N.Y. 13501

Original No. 3,622,313, dated Nov. 23, 1971, Ser. No. 734,822, Feb. 28, 1968, which is a continuation-in-part of abandoned application Ser. No. 636,700, May 8, 1967. Application for reissue Nov. 19, 1973, Ser. No. 416,967

Int. Cl. B22f *3/14*

U.S. Cl. 75—223 **28 Claims**



1. The method producing a densified object from metallic, inorganic nonmetallic and combinations of metallic and inorganic nonmetallic powders, which comprises hermetically sealing under subatmospheric pressure a volume of the powder within a vitreous container having an approximate capacity equal to the volume of powder contained therein; heating the container and contents to render the container plastic and to raise the powder temperature to an appropriate compacting temperature, subjecting the container to external pressure above the container internal pressure to cause collapse of the container about the powder within, to promote densification, and thereafter cooling the container and contents, and thereby effecting removal of the vitreous container from the densified object.

28,302
HARMONIC RADAR DETECTION AND RANGING SYSTEM FOR AUTOMOTIVE VEHICLES

Harold Staras and Joshua Shefer, Princeton, N.J., assignors to RCA Corporation

Original No. 3,781,879, dated Dec. 25, 1973, Ser. No. 267,947, June 30, 1972. Application for reissue Mar. 15, 1974, Ser. No. 451,422

Int. Cl. G01s *9/02*

U.S. Cl. 343—5 R **11 Claims**

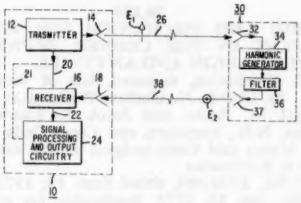
1. A detecting and ranging system for use with an automotive vehicle, comprising a transmitter, a receiver, an output means and a directional antenna network coupled to said transmitter and said receiver;

said transmitter comprising means for generating electromagnetic energy signals of a predetermined frequency;

said receiver comprising means adapted to detect electromagnetic energy signals which are derived from and harmonically related to said signals of said predetermined frequency;

said output means being coupled to said receiver and cooperating with said receiver for producing an output signal in response to said detected signals; and

said antenna network including means for selectively transmitting said signals of said predetermined frequency into a given transmission direction while polarizing said transmitted signals into a given polarization direction, said antenna network further including means selectively responsive only to electromagnetic signals originating from said given transmission direction, which signals have been derived from and are harmonically related to said transmitted signals and which have a polarization direction substantially orthogonal to said given polarization direction, for applying said selectively derived signals to said receiver.



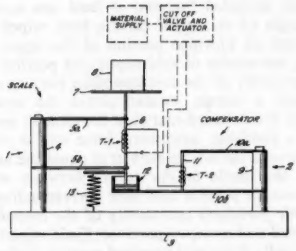
28,303
DYNAMICALLY COMPENSATED WEIGHING SCALES

Stewart B. Blodgett, Houston, Tex., assignor to Blodgett Manufacturing Company, a division of Mira-Pak, Inc.

Original No. 3,142,349, dated July 28, 1964, Ser. No. 202,884, June 15, 1962. Application for reissue May 23, 1973, Ser. No. 363,146

Int. Cl. G01g *23/14*

U.S. Cl. 177—164 **26 Claims**



3. A weighing system comprising a first scale, first transducer means for transmitting a signal proportional to the load applied to said scale, a compensator *including a suspension coupled to said scale,* second transducer means [for transmitting a signal proportional to the movement of said compensator], rate sensitive means *for producing a second signal proportional to the rate of movement of the scale* for connecting said scale and compensator whereby said second transducer means produces *said* [a] signal proportional to the rate of movement of said scale and means connecting said first and second signals.

PATENTS

GRANTED JANUARY 14, 1975

ERRATA

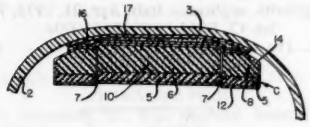
For CLASS	See PATENT NO.
036-011	3,859,727
062-045	3,859,805
062-055	3,859,806
062-055	3,859,807
128-145	3,860,042
239-265	3,860,134
353-109	3,860,326
240-047	3,860,903
346-135	3,860,906

PATENTS

GRANTED JANUARY 14, 1975

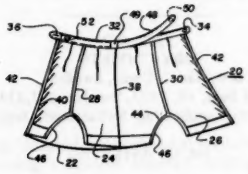
GENERAL AND MECHANICAL

3,859,666
CROWN CUSHION MEMBER
Michael T. Marietta, and Charles W. Marietta, both of 5538 University Blvd., Dallas, Tex. 75209
Filed Mar. 19, 1973, Ser. No. 342,439
Int. Cl. A42b *1/08*
U.S. Cl. 2—3 R **11 Claims**



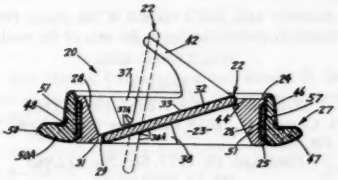
1. A crown cushion member for use in the shell of protective headgear, comprising, a cushion filling enveloped within an outer cover, means on said cover permitting of attachment of said member within said shell in an area overlying a wearer's head crown, said cushion filling including a plurality of individual annular cushion elements having substantially vertically disposed concentric joints therebetween, each said annular cushion element having a first soft layer juxtaposed the wearer's crown and a second relatively harder layer adjacent the shell interior surface whereby, upon fitting of said crown cushion member on a wearer's crown said joints between said annular cushion elements permit of independent vertical displacement of each said element within said cover.

3,859,667
GARMENT CONSTRUCTIONS
Laura C. Roy, 122 Laird St., Greensburg, Pa. 15601
Filed Dec. 26, 1973, Ser. No. 427,825
Int. Cl. A41d *1/14*
U.S. Cl. 2—212 **10 Claims**



1. A garment construction comprising waistline means, at least one front garment panel having an upper edge portion thereof secured to a front portion of said waistline means, at least one rear garment panel having an upper edge portion thereof secured to rear portion of said waistline means, means for joining the left lateral edges of said garment panels together, means for joining the right lateral edges of said garment panels together, at least one of said joining means being quick-detachable to provide a closable garment opening thereby, quick-detachable means for joining ends of said waistline means in juxtaposition to said detachable panel joining means, and a belt member normally extendable around the rear portion of said garment and having one end thereof affixed to one end of said waistline front portion and having the other end thereof quick-detachably joinable to the other end of said waistline front portion, whereby said rear garment panel can be laterally disengaged from one side of said front garment panel and folded thereacross, said belt member upon having its detachable end joined to said waistline front portion retaining said garment construction about a wearer's waist.

3,859,668
ROTATABLE SUTURING MEMBER
Lawrence Anderson, Minneapolis, Minn., assignor to Medical Incorporated, Minneapolis, Minn.
Division of Ser. No. 279,936, Aug. 11, 1972, Pat. No. 3,781,969, which is a continuation-in-part of Ser. No. 235,502, March 17, 1972, Pat. No. 3,763,548. This application Oct. 9, 1973, Ser. No. 404,516
Int. Cl. A61f *1/22*
U.S. Cl. 3—1 **21 Claims**



15. A suturing member connectable to tissues of a living creature comprising: means for accommodating live tissues to form a union between the member and the tissues, a sleeve located around an inner portion of said means, means located about said sleeve to apply a continuous contracting force on said sleeve, said sleeve having outwardly open grooves in the opposite end portions thereof, and means located in said grooves applying a continuous force on said end portions.

3,859,669
ARTIFICIAL HIP-JOINT AND A METHOD FOR ITS INSTALLATION
Yakov Isaevich Shersher, 1n Degtyarny pereulok, 3 kv. 42, Saratov, U.S.S.R.
Filed Apr. 27, 1973, Ser. No. 355,298
Claims priority, application U.S.S.R., May 4, 1972, 1776054; May 4, 1972, 1776055
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 **5 Claims**

1. An artificial hip-joint, comprising, in combination:

a. an endoprosthesis of the acetabulum formed as a seat;

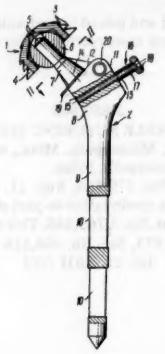
b. an endoprosthesis of the proximal portion of femur hinged to the endoprosthesis of the acetabulum, and including:

i. a head engageable with the seat;

ii. a neck rigidly connected to said head and having a straight axis; and

iii. an intertrochanteric section provided as an extension corresponding to the like axis of a femur of the neck and defining an intertrochanteric axis, the section being similar in shape to an inner canal of a femoral intertrochanteric region and bounded in a proximal

part thereof by two planes, a first of the planes arranged substantially perpendicularly to the intertro-



chanteric axis, and a second of the planes being substantially perpendicular to the axis of the neck.

3,859,670

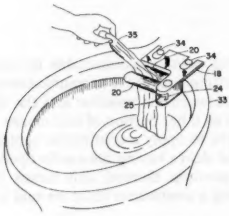
SOILED DIAPER WRINGER DEVICE

John M. Crump, Jr., 1018 Parkridge Circle West, Jacksonville, Fla. 32211

Filed Apr. 10, 1972, Ser. No. 213,963

Int. Cl. D06f *45/22*

U.S. Cl. 4—1 **2 Claims**



2. A soiled diaper wringer device, adapted for attachment to a toilet water closet bowl or the like comprising, in combination, a main mounting frame, two wringer roller shafts, two wringer roller shaft attachment means attached to said main mounting frame, said two wringer roller shaft attachment means each having a vertical sidewall and upper surface with said sidewalls each having apertures therein for receiving said pair of wringer roller shafts; said side wringer roller shaft attachment means each having a section of their upper surfacee removed and a cam action roller spread lever mounted therein with the top surface of said cam action spread levers being normally flush with the top surface of the main mounting frame and said wringer roller shaft attachment means, said cam action roller spread levers being operatively connected to the ends of said wringer roller shaft; each cam action roller spreader being pivotally mounted upon one of said wringer roller shafts and having a camming surface, wringer rollers mounted on said wringer roller shafts; resilient means attached to said wringer roller shafts for holding said wringer rollers in a position to provide resistance to separation of said wringer rollers, and to maintain the longitudinal contact surfaces of the rollers under pressure; fasteners of the threaded nut type for retaining said cam levers onto the ends of said one of said wringer roller shafts, keepers of the snap ring type for retaining the ends of the other wringer roller shaft in position, slots located in the side wall of each of said wringer roller shaft attachment means for guiding the said other wringer roller shaft during rectilinear translation, two slotted apertures located in the main mounting frame adapted for mounting the soiled diaper wringer device onto a pair of water closet seat bolts.

3,859,671

URINE CONTAINER FOR URINALYSIS

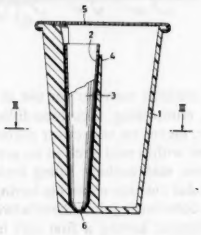
Marianna Tomasello, Viale Molise 1, 20092 Cinisello Balsamo, Italy

Filed Apr. 13, 1973, Ser. No. 351,006

Claims priority, application Italy, Apr. 21, 1972, 7309/72

Int. Cl. E03d *13/00;* **B65d** *1/04*

U.S. Cl. 4—110 **4 Claims**



1. A container for collecting urine for urinalysis, comprising a hollow container having a bottom closed end, a side wall and a mouth end opposite the closed end, the interior of the body being provided with means constituting a chamber therein, said chamber extending from the bottom end of the container towards the mouth end and having an open upper end spaced inwardly of the mouth end of the container, and an open-ended test tube temporarily received and held in said chamber, the open end of the test tube being above the upper end of the chamber and inwardly of the mouth end of the container, thereby facicitating the simultaneous filling of both the test tube and the interior of the container.

3,859,672

DRY CLOSETS

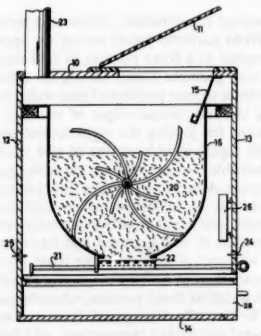
Torsten Modig, Brogatan 2, Umea, Sweden

Filed Sept. 14, 1973, Ser. No. 397,234

Claims priority, application Switzerland, Sept. 19, 1972, 12051/72

Int. Cl. A41k *11/02*

U.S. Cl. 4—111 **7 Claims**



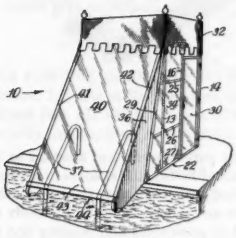
1. A closet for the biological decomposition of human waste matter, comprising a collecting vessel having its bottom at

least partly perforated and containing a bed of material suitable for biologically decomposing such waste matter introduced thereto, and mechanical means within said vessel and projecting into said bed material for moving, at least intermittently, at least part of the bed material for aerating the same and for removing newly introduced waste matter from its point of falling onto the bed and for mixing such matter with said bed material, said mechanical means comprising a horizontal shaft, rotatably journaled to the side walls of said vessel, and a number of arms attached to said shaft and extending in generally radial directions therefrom.

3,859,673
SHELTER FOR USE ADJACENT THE SIDE OF A SWIMMING POOL

Arthur E. Meyerhoff, Sr., P.O. Box 489, Rancho Santa Fe, Calif. 92067

Filed Mar. 22, 1973, Ser. No. 343,919
U.S. Cl. 4—172 **2 Claims**



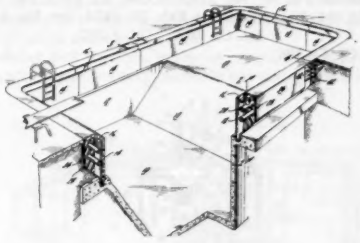
1. A shelter adapted to be placed at the side of a swimming pool comprising, a support structure defining a housing, a front wall on the housing and extending outwardly and downwardly therefrom to terminate adjacent the normal water level in the pool, a pair of substantially rigid side walls on the housing and joined at their edges to opposite edges of the front wall to form therewith a substantially closed space over a minor portion of the area of the pool adjacent said side, a rear wall and a top wall on the housing co-operating with the front and side walls to form an enclosure, and means providing ingress and exit from the enclosure.

3,859,674
PREFABRICATED SWIMMING POOLS

David P. Thomson, Chicago, Ill., assignor to Chicago Swimming Pool Manufacturing Inc., Maywood, Ill.

Division of Ser. No. 82,204, Oct. 19, 1970, Pat. No. 3,720,964.
This application Dec. 8, 1972, Ser. No. 313,592
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.19 **8 Claims**

1. A liquid containing pool comprising, in combination, a plurality of prefabricated panels comprised of rigid plastic sheet material internally reinforced with fiberglass, said panels containing an integrally molded roll-over gutter portion along

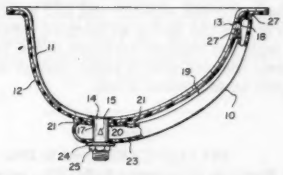


one edge thereof with at least one of said panels containing liquid draining means in the gutter portion thereof.

3,859,675
SINK OVERFLOW

Dick T. Van Manen, Canandaigua, and Ronald D. Buckley, Geneva, both of N.Y., assignors to Voplex Corporation, Rochester, N.Y.

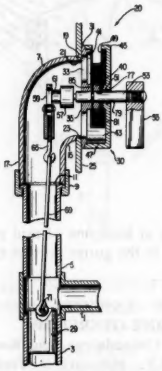
Filed June 21, 1973, Ser. No. 372,243
Int. Cl. E03c *1/24*
U.S. Cl. 4—187 R **3 Claims**



1. In a molded plastic sink having a main drain and an undersurface reinforced with resin bonded glass fibers, an improved overflow comprising:

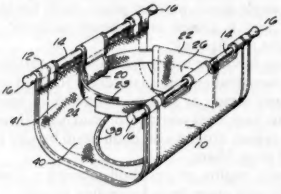
a. a rigid, single piece, molded plastic body having a hollow interior that is closed and smooth surfaced to form a watertight passageway;
b. said body having a lower region with a through opening closely surrounding said main drain for said sink;
c. said lower region of said body having an upper surface sealed to said undersurface of said sink throughout an arcuate region around said main drain by said resin bonding said glass fibers;
d. said lower region of said body having a lower surface sealed to said main drain by sealing means;
e. said main drain having an opening communicating with said passageway in said body between said upper and lower surfaces of said lower region of said body;
f. said body having an upper region with a wall adjacent said sink, and said sink and said upper region each having a registered, overflow drain opening extending through said sink and through said wall into said passageway in said body;
g. said wall of said upper region of said body being sealed to said sink by said resin bonding said glass fibers throughout a region surrounding said overflow drain opening; and
h. said body having a mid region spaced from said undersurface of said sink.

3,859,676
BATHTUB OR THE LIKE DRAIN CONTROL AND OVERFLOW REGULATOR
Mikio Kato, 1003 Knottingham Pl., La Vale, Md. 21502
Division of Ser. No. 318,898, Dec. 27, 1972, Pat. No. 3,835,484. This application Feb. 20, 1974, Ser. No. 444,167
Int. Cl. E03c *1/24, 1/232*
U.S. Cl. 4—206 **3 Claims**



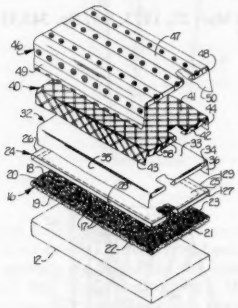
1. A closure assembly for the overflow drain of a bathtub or similar receptacle comprising a plate having openings therein disposed over the overflow port of said receptacle; an annular shoulder extending from said plate toward the interior of said receptacle; an extension on said shoulder; a skirted cap in engagement with said shoulder and said shoulder extension, the skirt of said cap having an aperture therein adapted for registry with said shoulder extension in one position of said skirted cap, whereby flow of liquid through said closure assembly may be terminated at will.

3,859,677
INVALID CARRYING SLING
Louis F. Nordwig, Menomonee Falls, Wis., assignor to Invalid Carrier Inc., Menomonee Falls, Wis.
Filed Oct. 3, 1973, Ser. No. 403,310
Int. Cl. A61g *1/02*
U.S. Cl. 5—89 **10 Claims**



1. An invalid carrying sling for carrying an incapacitated person in a seated position, said sling comprising a flat, generally rectangular sheet of flexible material, a first plurality of loops longitudinally aligned along one side edge of said sheet, a second plurality of loops longitudinally aligned along the opposing side edge of said sheet, a first rigid elongated handle extending through said first plurality of loops, a second rigid elongated handle extending through said second plurality of loops, the individual loops of said first and second plurality of loops being spaced apart from the nearest adjacent loop by a distance which is sufficient to admit a hand between the adjacent loops for the purpose of grasping the exposed portion of the handle to support the sling, a third plurality of loops attached to said sheet and positioned to slidably receive a flexible belt for attaching said incapacitated person to said sling, and a belt extending through said third plurality of loops, a rear panel made of flexible material and attached at one end to said sheet near the rear edge thereof, one of the loops of the third plurality of loops being formed at the other end of said rear panel whereby the rear panel will be supported by said flexible belt to serve as a back for the sling, said rear panel being foldable flat against said sheet to facilitate rolling the sling about one or both of said handles.

3,859,678
DISPOSABLE BED COVERING
Rachel D. Davis, 111 E. Gordon St., Kingston, N.C. 28501
Filed Oct. 9, 1973, Ser. No. 404,293
Int. Cl. A47g *9/00;* **A47c** *23/00*
U.S. Cl. 5—334 R **11 Claims**



1. A disposable patient underpad adapted to be positioned upon a conventional bed mattress so as to underlie and cushion the entire body of a patient, and characterized by the ability to provide air circulation about the body of the patient to thereby assist in preventing and treating bed sores and the like, said underpad comprising

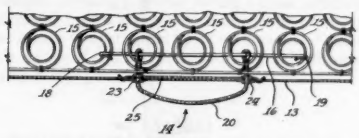
an air permeable, highly compressible mat of generally rectangular outline to define upper and lower generally flat surfaces and being sized to completely overlie a conventional bed mattress, said mat having substantially uniform thickness of at least about one inch between said upper and lower surfaces, and comprising non-woven polymeric filaments which occupy less than 50 percent of the total volume of the mat and such that the mat has an air permeability of at least 300 cubic feet per minute per square foot,

an air permeable sheet carried by said mat and including a central portion overlying said upper surface of said mat, edge portions folded about the respective edges of said mat to thus overlie a portion of said lower surface of said mat, and means for maintaining said sheet in said folded condition to thereby maintain the assembly thereof with said mat, said sheet comprising a non-woven polymeric material having an air permeability of at least 200 cubic feet per minute per square foot.

3,859,679
MATTRESS HANDLE WITH MULTIPLE SPRING ENGAGING ROD
Fred H. Bartz, and Kenneth W. Dethloff, both of Milwaukee, Wis., assignors to Fred H. Bartz and Kenneth W. Dethloff
Filed Dec. 20, 1973, Ser. No. 426,610
Int. Cl. A47c *23/00*
U.S. Cl. 5—345 B **5 Claims**

1. An inner spring mattress and handle construction including an inner spring mattress having side panels and end panels extending around an inner spring unit, upper and lower cover

panels above and below said spring unit, and upper and lower border wires underlying said upper and lower cover panels respectively extending around the periphery of said spring unit, said inner coil spring unit including a first row of coil springs parallel to and adjacent one side panel, a second row of coil springs parallel to and adjacent said other side panel, a plurality of coil springs disposed intermediate said first and second rows, said coil springs of said first and second rows connected at their upper end to said upper border wire and at



their lower end to said lower border wire, an anchor rod connected at each end to spaced apart coil springs in said first row, said rod extending through at least one coil spring disposed intermediate said sapced apart coil springs, said rod being disposed within the radial confines of said coil springs, a flexible handle extending through a side panel of said mattress having end portions loosely secured to said anchor rod such that when outward pulling forces are exerted on said handle, said anchor rod distributes said forces to said coil springs with which it is associated.

3,859,680

MARKER FOR USE IN FRESH AND SEA WATER

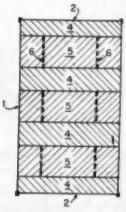
Abraham Larsen, 231 Evans Rd., Durban, South Africa

Filed July 12, 1973, Ser. No. 378,663

Claims priority, application South Africa, July 14, 1972, 72/4254

Int. Cl. B63b *51/00*

U.S. Cl. 9—9 **6 Claims**



1. A marker adapted for use at sea and on lakes, rivers and the like bodies of water comprising a charge of a water dispersable dye located in at least two layers, the layers being separated from each other by flotation means having ducts which communicate between the dye layers on each side of the flotation means and an end sealed hollow cylinder adapted to contain the dye and the flotation means, the cylinder being provided with at least one discharge orifice through which the dye is adapted to be dispersed under operative conditions.

3,859,681

VESSELS

George W. Mc Vay, Mahone Bay, Nova Scotia, Canada, and Thomas A. Stansbury, 7237 S. Shore Dr., Chicago, Ill. 60649

Filed May 5, 1972, Ser. No. 250,688

Int. Cl. B63b *3/00*

U.S. Cl. 9—6 **8 Claims**

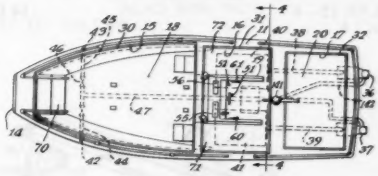
1. A vessel comprising,

a hull for the purpose of navigation having a gunnel,

a weather deck rigidly mounted on said hull and extending inwardly from said gunnel to at least one aperture occupying a substantial portion of the available horizontal weather deck area,

machinery and vessel operation systems mounted in said hull below said weather deck,

a weather deck structure having an integral deck capable of supporting personnel mounted in one said aperture when-



ever the vessel is underway, said weather deck structure enclosing said machinery and vessel operation systems in said hull,

means for operationally controlling the vessel mounted on said weather deck structure, and

means for securing said weather deck structure in said one aperture whenever said vessel is underway and for facilitating the removal of said weather deck structure to permit increased access to said machinery and vessel operation systems.

3,859,682

TUBULAR TRANSPORTATION ELEMENT

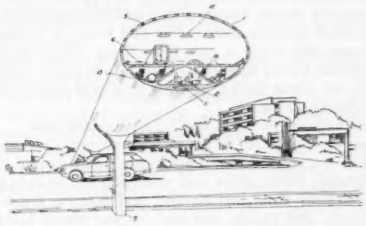
Jan Sulkiewicz, Helsinki, Finland, assignor to KM Insinooritoimisto Oy-KM Ingenjorsbyra Ab, Helsinki, Finland

Filed May 2, 1973, Ser. No. 356,359

Claims priority, application Finland, May 3, 1972, 1254/72

Int. Cl. E01d *7/02*

U.S. Cl. 14—3 **5 Claims**

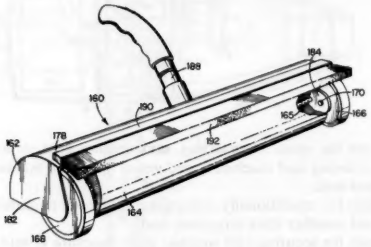


1. A tubular transportation element for mounting on horizontally spaced apart supports and having at least one deck member within said element for vehicle traffic and other transportation, said element comprising a circumferentially closed outer wall of reinforced plastic extending as continuous unitary piece over the length of said element between said supports, and a circumferentially closed inner wall extending as a continuous unitary piece over the entire length of said element between said supports coextensive with and at a distance from said outer wall, generally radial partition members extending between said outer and inner walls generally in the longitudinal direction of and over the entire length of said element and forming with said outer and inner walls closed compartments at spaced positions along the circumference of said walls, reinforcement material filling said formed compartments and forming unitary stiffening members, said stiffening members together with said walls imparting to said element a preselected load carrying capacity over a span between said

supports comprising the entire length of said element and being equal to several times the diameter of said element.

3,859,683
FRICTION-DRIVEN ROTARY CLEANING APPARATUS WITH COOPERATIVE COMPLEMENTARY TOOL MEANS

John H. Coult, 901 N. President St., Wheaton, Ill. 60187
Filed Apr. 19, 1971, Ser. No. 135,141
Int. Cl. E01h *1/02*
U.S. Cl. 15—4 **14 Claims**

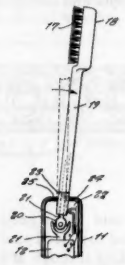


1. Ground and floor cleaning apparatus, comprising:
a cylindrical brush having bristles extending from a central shaft;
a drive train comprising:
friction-driven means comprising a pair of wheels carried on stub axles one at each end of said cylindrical brush, said wheels being rotatable by frictional forces when said apparatus is moved across a surface being cleaned, and
transmission means for coupling said wheels to said brush shaft such that rotation of said wheels effects rotation of said cylindrical brush;
housing means for rotatably supporting both ends of said brush shaft and for rotatably supporting said stub axles on a common wheel axis forwardly of said brush shaft, said housing means having a thin-walled longitudinal body portion partially surrounding said brush to protect said brush and shield a user from flying debris, said body portion having substantial curvature in planes transverse to said brush shaft to provide structural rigidity for said housing means;
handle means joined to said housing means; and
complementary tool means for use in cooperation with said cylindrical brush, said tool means being carried by said housing means above said wheel axis and so as to extend forwardly from and beyond said housing means, said brush, said wheels, and said housing means being constructed and arranged such that said apparatus is operative in two attitudes - in a first attitude wherein said cylindrical brush engages said surface and wherein elevational adjustment of said handle effects an adjustment of the interference between said brush and the surface being cleaned, and an inverted second attitude wherein said complementary tool means is in operative engagement with said surface.

3,859,684
BRUSH

John A. Moskwinski, 721 S. 36th St., South Bend, Ind. 47803
Filed June 18, 1973, Ser. No. 371,183
Int. Cl. A46b *13/02*
U.S. Cl. 15—23 **1 Claim**

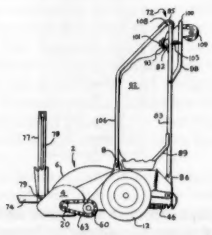
1. In a brush, the combination of a hollow handle with a reversible electric motor therein connectable to a power source, an off-forward-reverse switch on said handle, and means carried by said handle for providing a tooth brushing action, said means comprising a rotary brush on a motor shaft of said motor, a portion of said motor shaft being protectively enclosed in a tubular sheath, said sheath projecting from a position within said handle toward said brush, a universal joint along said motor shaft being located between said motor and said sheath, a handle slot through which said shaft and sheath protrude outwardly of said handle, said sheath in a vicinity of



said slot being cross-sectionally non-circular to prevent rotation therein about a longitudinal axis of said sheath, a second switch inside said handle being aligned with said slot to be depressed by said sheath when pivoted on said universal joint toward one side, said second switch being in series circuit with the first said switch, motor and said power source for automatically opening and closing said circuit.

3,859,685
DEBRIS COLLECTOR

Charles W. Doering, Clarksville, Ind., and Samuel W. Smith, Carlisle, Ky., assignors to Brinley-Hardy Co., Inc., Louisville, Ky.
Continuation of Ser. No. 195,607, Nov. 4, 1971, abandoned. This application Feb. 12, 1973, Ser. No. 331,694
Int. Cl. A01g *1/12*
U.S. Cl. 15—83 **10 Claims**



1. An apparatus for collecting debris including:
a frame having wheels to support said frame;
means to pick up debris as said frame is advanced, said pick-up means being supported by said frame;
a housing supported by said frame and having a debris confining chamber;
means disposed within said housing between said pick-up means and said debris confining chamber to compress debris picked up by said pick-up means, said compression means being supported by said frame, said compression means receiving debris from said pick-up means as a continuous mat or the like;
said compression means including:
a compression area within said housing in which the debris is compressed as a continuous mat or the like;
and rotatable means within said housing to advance the debris from said compression area to said debris con-

fining chamber as a continuous mat or the like so that additional compression of the debris occurs within said debris confining chamber;

said debris confining chamber having an outlet of fixed cross sectional area;

means to removably connect a debris retaining means to said outlet of said debris confining chamber to receive the continuous mat of compressed debris;

support means for holding a debris retaining means in position to be force filled with debris through said outlet of said debris confining chamber;

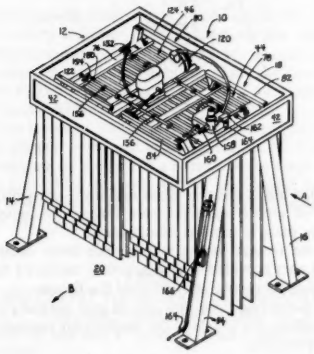
said debris confining chamber having a cross sectional area increasing from said compression area toward said outlet; and means to operate said pick-up means and said rotatable means of said compression means at least when said frame is being advanced.

3,859,686

SCRUBBING APPARATUS FOR VEHICLES

Donald E. Breish, Willingboro, N.J., assignor to Sherman Car Wash Equipment Co., Palmyra, N.J.

Filed May 23, 1973, Ser. No. 363,184
Int. Cl. B60s *3/04*
U.S. Cl. 15—97 R **16 Claims**



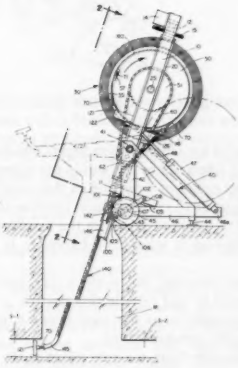
1. Scrubbing apparatus for vehicles comprising a frame having an opening therein adapted to receive a vehicle for passage therethrough by relative movement between said frame and vehicle along a path lengthwise of the vehicle, at least two scrubbing members carried by said frame and disposed in said opening side by side transversely of said lengthwise path, each scrubbing member comprising a rigid oscillatory support element carried by said frame, a plurality of scrubbing curtains suspended from said support element and a plurality of substantially rigid mounting pieces, at least one for each said curtain fixedly mounting said curtains to said support element, said curtains being arranged on said support element in spaced generally parallel relationship with each curtain extending transversely of said lengthwise path and having an end portion that will extend beyond a side of the vehicle, and each curtain presenting a row of closely related elongated flexible scrubbing strips normally freely hanging when the scrubbing members are beyond the ends of the vehicle and substantially in continuous contact with the vehicle during oscillations of the support element when said members are over the vehicle, and there being means for oscillating said scrubbing curtains of said scrubbing members through said support elements in said lengthwise path whereby the scrubbing strips thereof may act on the top, side, front and rear surfaces of a vehicle and the lower portions of bumpers and recessed window wells of a vehicle with a scrubbing and flicking action to clean the same, and relatively positionable means for controlling the oscillations of said support elements and scrubbing curtains in a manner that the oscillations of the support elements and scrubbing curtains of one half the number of said scrubbing members are out of phase with those of the other half of said number of said scrubbing members.

3,859,687

INCLINED CARRIAGE FOR SEWER RODDING MACHINE

Charles B. Caperton, 52 Pitney Ave., Springlake, N.J. 07762

Filed Nov. 28, 1973, Ser. No. 419,505
Int. Cl. B08b *9/02*
U.S. Cl. 15—104.3 SN **4 Claims**



1. Rodding apparatus for clearing obstructions in sewers, water pipes, and the like, said apparatus including:

a. a frame;

b. a carriage mounted in said frame for rotation about the longitudinal axis of said frame;

c. a storage reel for rod supported for rotation in said rotatable carriage;

d. drive means mounted on said frame for driving said carriage rotationally;

e. a drive and twist-barrier wheel supported in said carriage;

f. drive means mounted on said carriage for driving said wheel rotationally to drive said rod;

g. first guide means between said rod storage reel and the peripheral edges of said wheel for guiding said rod between said storage reel and the periphery of said wheel;

h. second guide means between the periphery of said wheel and the forward end of said carriage for guiding said rod;

i. a platform supported at the forward end of said frame;

j. first and second opposed reels mounted on said platform for rotation about axes normal to the plane of said platform;

k. a sectionalized restraining tube comprising first and second series of short hollow section halves on opposite side of the center axis of said restraining tube, said section halves being connected together by pivotal links, said first and second series of section halves being wound up for storage on said first and second reels;

l. converging slide means mounted on said platform through which said first and second section halves pass for forcing said halves into abutting interlocking relation to form an elongated hollow restraining tube for said rod; and

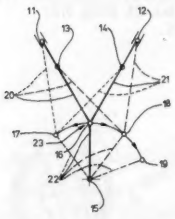
m. a chassis and means for pivotally mounting said frame on said chassis, for tilting said frame relative to said chassis, thereby to raise the rod storage reel and drive wheel and to lower said platform into working position.

3,859,688

APPARATUS FOR CLEANING CONCEALABLE LIGHTS

Ernst Fiala, Braunschweig-Querum, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Feb. 1, 1973, Ser. No. 328,501
Claims priority, application Germany, Feb. 26, 1972, 2209122
Int. Cl. B60s 1/02
U.S. Cl. 15—250.01 3 Claims



1. Apparatus for cleaning headlights which are mounted for concealment when not in use within the outer skin of a vehicle by movement either of a portion of the vehicle skin relative to each headlight or of the headlight relative to the vehicle skin between a first position in which the headlight is exposed and a second position in which the headlight is concealed, comprising:

means for cleaning the surface of each headlight upon movement of said vehicle skin portion or upon movement of the headlight, as the case may be, between said first and second positions; and

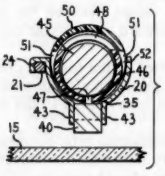
means operable from a single point at the driver's position in the vehicle for (1) individually moving each vehicle skin portion or each headlight between said first and second positions whereby each headlight may be cleaned and returned to the exposed position while retaining the other headlight in the exposed position and (2) moving both vehicle skin portions or both headlights to the second position at the same time.

3,859,689

DETERGENT HOLDER ON WINDSHIELD WIPER ARM

Donald E. Rouse, 1680 W. 132nd, Beaverton, Oreg. 97005

Continuation-in-part of Ser. No. 261,254, June 9, 1972, Pat. No. 3,792,506. This application Jan. 14, 1974, Ser. No. 432,816
Int. Cl. B60s 1/02
U.S. Cl. 15—250.03 10 Claims



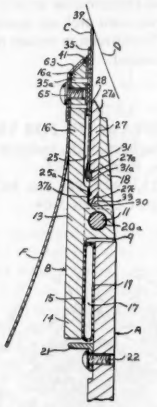
1. A detergent holder for a windshield wiper comprising an elongated receptacle having an open forward side and a longitudinal slot in its rear side, a wick in said slot, a detergent stick in said receptacle, a hood overlying said open forward side of said receptacle to shield said detergent stick from falling rain, the opposite sides of said hood being spaced away from the sides of said receptacle to provide lateral gaps for the lateral entrance of water into said receptacle as a result of air currents across the windshield when a vehicle carrying said wiper and detergent holder is in motion, and means for mounting said receptacle on the windshield wiper with said wick spaced away from the windshield.

3,859,690

DOCTOR BLADE ASSEMBLY

Jack Frederick Brown, Pierrefonds, Quebec, Canada, assignor to James Ross Limited, Lachine, Quebec, Canada

Filed Oct. 2, 1972, Ser. No. 293,857
Int. Cl. B31f 1/14
U.S. Cl. 15—256.51 17 Claims



1. A doctor blade pressure plate assembly, comprising,

an array of spaced apart pressure fingers connected to a pressure plate in parallel relationship,

each of the fingers having a one-piece body including a central part provided with a generally centered fulcrum for individual pivotal mounting of the finger,

a tongue extending from one side of said central part perpendicularly to the axis of the fulcrum for receiving doctoring pressure,

a pair of jaws extending directly from the opposite side of said central part and defining first and second spaced apart opposed surfaces on the side of the fulcrum opposite to said tongue, said spaced surfaces forming therebetween a doctor blade holding space immediately adjacent said central part,

the pressure plate being permanently secured to the first surfaces and joining said pressure fingers.

3,859,691

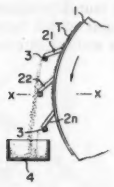
CLEANING APPARATUS FOR ELECTROPHOTOGRAPHY

Hajime Katayama; Syusei Tsukada, both of Tokyo; Talayuki Kitajima, Yokohama, and Tsukasa Kuge, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 120,256, March 2, 1971, abandoned. This application May 17, 1973, Ser. No. 361,164
Claims priority, application Japan, Mar. 10, 1970, 45-20285; Mar. 17, 1970, 45-25511; Mar. 17, 1970, 45-25512; Nov. 24, 1970, 45-103504
Int. Cl. G03g 13/16
U.S. Cl. 15—256.51 9 Claims

1. A cleaning apparatus for an electrophotographic copying device wherein an electrophotographic latent image formed on the surface of a photosensitive member is moved past a series of processing stations including a developing station at which said latent image is developed with toner to form a toner image and a transfer station at which said toner image is transferred to copying material, comprising an elastic clean-

ing blade for removing residual toner from said photosensitive member after transfer of said toner image to said copying material, said residual toner being scratched off in the direction opposite to that of the movement of said photosensitive member, one end of said elastic cleaning blade having a cleaning edge, and holder means for supporting the opposite end of said elastic cleaning blade and disposing said cleaning edge in contact against the surface of said photosensitive member, said holder means disposing said elastic cleaning blade relative to said photosensitive member to engage a substantially upwardly moving surface portion of said photosensitive member,



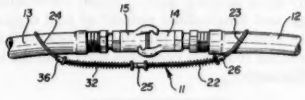
said elastic cleaning blade being placed above the horizontal axis of a rotary member carrying said surface, said holder means disposing said elastic cleaning blade relative to said photosensitive member at an angle θ_1, at the pre-cleaning side, subtended by the axis of the end portion of the blade contacting the photosensitive member with said cleaning edge and a straight line touching the surface of the photosensitive member at the contact point, and at an angle θ_1, at the pre-cleaning side, subtending by the axis of a portion of the blade near said opposide end which is supported by said holder means and said line, said angles θ_1 and θ_1 satisfying the following relation: $\theta_1 > \phi > \pi/2$

3,859,692

RESTRAINT FOR FLEXIBLE CONDUITS

Sherwood V. Waterman, 9 Lakewood Heights Dr., Lakewood, Colo. 80215, and Roy F. Humble, 8365 Zepkyr St., Arvada, Colo. 80005

Filed June 12, 1973, Ser. No. 369,374
Int. Cl. A44b *21/00;* **F16l** *35/00*
U.S. Cl. 24—73 R **4 Claims**



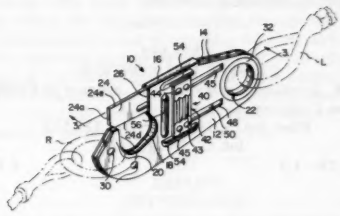
1. A safety restraint attachment for use on separable flow conduits that are subjected to differential pressure influences comprising a centrally disposed body section, a strand of material doubled on itself and extending outwardly from said body to provide a loop component for engagement about said flow conduit at a position on one side of an expected place of separation of said conduit, an anchor component on said attachment for engagement to said flow conduit at a position on another side of said expected place of separation, a slide bushing at said loop component and disposed about both legs thereof for reciprocal movement therealong to adjust the size of the provided loop, and resilient means acting on said slide bushing and biased to reduce the size of said loop whereby the loop component may be secured to flow conduits of varied size, said central body being a crimped bushing for securely holding the free ends of said strand material.

3,859,693

SLIDING SNAP SHACKLE

Charles P. Breed, 1220 Boucher Ave., Annapolis, Md. 21403

Filed June 12, 1973, Ser. No. 369,295
Int. Cl. F16g *15/00*
U.S. Cl. 24—241 SL **7 Claims**



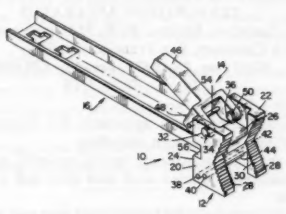
1. A tension load bearing shackle comprising an elongated load bearing member with a hook portion at one end adapted to engage a load and an elongated internal slideway generally parallel to the axis of load of said elongated load bearing member, an elongated hook closing gate member slidably disposed in said slideway, means to bias said gate member to a hook closed position, means to lock said gate member in said hook closed position and opening means comprising a pair of slide members disposed on opposite sides of said load bearing member operatively connected to said gate member by at least one transverse pin engaging said slide members and said gate member and disposed through and movable along elongated aligned slots in opposite sides of said load bearing member to unlock said locking means, override said bias means and slidably retract said gate member to a hook opened position.

3,859,694

AERIAL CABLE CLAMP

Maurice Lafond, North Babylon, and Robert E. Joslin, Lindenhurst, both of N.Y., assignors to Plessey Incorporated, New York, N.Y.

Filed Mar. 7, 1974, Ser. No. 448,945
Int. Cl. B65d *63/00*
U.S. Cl. 24—271 **15 Claims**



10. A clamp for securing equipment to a cable comprising:
a clamping head including a pair of spaced, parallel V-blocks connected by an integral, intermediate web portion;
a locking handle including a handle portion and an integral yoke portion;
a pair of pivot pins pivotally securing the distal ends of said yoke portion between said parallel V-blocks adjacent said web portion;
flexible strap securing means secured within said yoke portion in spaced relation to said pivot pin axis on the side of said yoke portion closest to said web portion;
a flexible strap mounted on said strap securing means;
said strap securing means being positioned so as to pass through a locking plane intermediate respective open and

closed positions of said locking handle; said locking plane being the plane tangent to the adjacent side of a cable engaged by the V-cut faces of said blocks which passes through said pivot pin axis;

strap retainer means extending between said V-blocks on the side opposed to said pivot pin axis; and

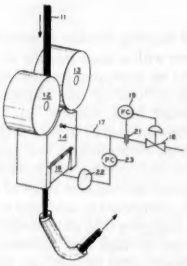
an equipment mounting bar secured to said web portion and extending outwardly therefrom.

3,859,695

STUFFER BOX CONTROL

Wayne K. Erickson, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 5, 1973, Ser. No. 321,525
Int. Cl. D02g *1/12*
U.S. Cl. 28—1.7 **6 Claims**



1. In a stuffer box crimping process in which a yarn is forced into a crimping chamber and the outlet of the crimping chamber is provided with discharge regulation means in the form of a hinged flapper, the improvement which comprises:

feeding a pressure fluid into the crimping chamber at a substantially constant flow rate; and

maintaining the fluid pressure in the crimping chamber substantially constant by controlling the hinged flapper discharge regulation means in response to said fluid pressure.

3,859,696

JET MEANS IN A THERMOPLASTIC YARN REBOUND TEXTURIZING APPARATUS

Lloyd M. Guenther, Severna Park, Md., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 28, 1973, Ser. No. 429,054
Int. Cl. D02g *1/16*
U.S. Cl. 28—1.4 **2 Claims**

1. A bounce crimping apparatus for texturizing multifilament thermoplastic yarn including:

a yarn texturizing housing having an inlet, a fluid outlet longitudinally aligned with said inlet and a lateral yarn outlet,

means for introducing a heated fluid into said yarn texturizing housing for drawing yarn into said chamber,

a foraminous surface positioned across said fluid outlet of said housing, said heated fluid introduced into said housing for drawing yarn into said housing further serving to hurl the yarn against said foraminous surface to axially compress and crimp the yarn filaments and rebound the yarn through said lateral outlet, and

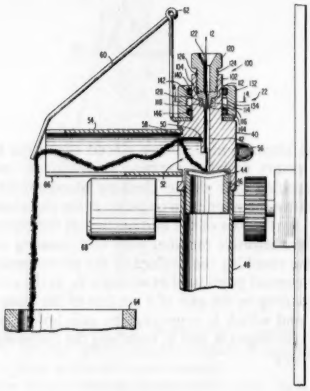
means for collecting the crimped yarn while maintaining the yarn substantially free from longitudinal tension,

the improvement comprising:

orifice means removably positioned within the interior of said yarn texturizing housing, said orifice means including a longitudinal passage operatively coaxially positioned with respect to a central longitudinal axis of said yarn texturizing housing for receiving multi-filament thermoplastic yarn to be crimped within said yarn texturizing housing,

a first frustoconical surface fashioned upon the exterior of said orifice means for intimate engagement with a mating first frustoconical ledge fashioned within the interior of said yarn texturizing housing,

a second frustoconical surface fashioned upon the exterior of said orifice means operatively downstream from said first frustoconical surface for cooperation with a compatible second frustoconical ledge fashioned within the interior of said yarn texturizing housing, said second frustoconical surface upon said orifice means and said second frustoconical ledge being operatively disposed in a mutually adjacent but spaced posture to form an annular orifice between the exterior of said orifice means and the interior of said yarn texturizing housing; and



said means for introducing a heated fluid into said yarn texturizing housing being connected to said yarn texturizing housing laterally between said first and second frustoconical surfaces wherein heated fluid may be injected into a plenum chamber interior of said yarn texturizing housing defined by the interior wall of said yarn texturizing housing, the exterior surface of said orifice means, said first frustoconical surfaces, and said second frustoconical surfaces wherein heated fluid will exit from said interior plenum chamber through said annular orifice and thereby serve to draw multi-filament thermoplastic yarn through said longitudinal passage of said orifice means, heat the yarn and axially hurl the yarn against said foraminous surface to axially compress and crimp the individual yarn filaments.

3,859,697

FORAMINOUS SURFACE MEANS IN A THERMOPLASTIC YARN REBOUND TEXTURIZING APPARATUS

Lloyd M. Guenther, Severna Park, Md., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 28, 1973, Ser. No. 429,056
Int. Cl. D02g *1/16*
U.S. Cl. 28—1.4 **2 Claims**

1. In bounce crimping apparatus for texturizing multifilament thermoplastic yarn including;

a yarn texturizing chamber having an inlet, a fluid outlet aligned with said inlet and a lateral yarn outlet,

means for introducing a heated fluid into said yarn texturizing chamber for drawing yarn into said chamber,

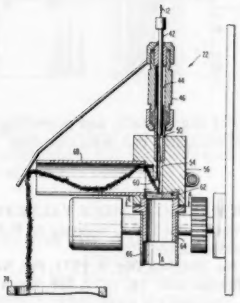
a foraminous surface transversely positioned across said fluid outlet of said chamber, said heating fluid introduced

into said chamber for drawing yarn into said chamber further serving to hurl the yarn against said foraminous surface to axially compress and crimp the yarn filaments and rebound the yarn through said lateral outlet of said yarn texturizing chamber,

platen means underlying said foraminous surface for supporting said foraminous surface against said fluid outlet of said yarn texturizing chamber, and

means for collecting the crimped yarn while maintaining the yarn substantially free from longitudinal tension,

the improvement comprises:



said foraminous surface, including

an upper screen portion operable to overlie at least a portion of said platen means for rebounding yarn to be texturized while simultaneously permitting passage of said heating fluid, and

a downwardly projecting locator tab connected to said upper screen surface for engagement with said underlying platen to fixedly and reliably orient said upper screen surface with respect to said lateral outlet of said yarn passage chamber wherein the preferred texture of said upper screen surface is reliably and accurately oriented in a direction parallel with the axis of said lateral outlet of said yarn passage chamber.

3,859,698

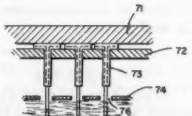
NEEDLE FELTING METHOD

Miyoshi Okamoto, Osaka; Toyoniko Hikota, Kyoto, and Kitao Shimizu, Osaka, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Division of Ser. No. 116,146, Feb. 17, 1971, Pat. No. 3,774,273. This application May 2, 1973, Ser. No. 356,563

Int. Cl. D04h *18/00*

U.S. Cl. 28—72.2 R **6 Claims**



1. A method for producing a felted fabric from a web of loosely matted fibers which comprises the steps of providing a fibrous web in which a plurality of fibers is in a generally uni-directional arrangement, subjecting the fibrous web to repeated punching by a plurality of needles moving as a conjugated group, while said fibers are restrained between spaced-apart surfaces having openings therein for the movement of said group of needles, and through which the plurality of conjugated needles pass, at least some of the needles having capacity to catch some of said loosely matted fibers to displace them across said direction of said uni-directional arrangement, to produce a felted fabric, each of said conjugated needles being mounted separately from each other with a predetermined space therebetween, each of the conjugated needles being a bundle of plural individual needles, with an interval provided between the points of the individual needles in a range from about 300 to 5,000 microns, and relatively reciprocating the conjugated needles through the openings and penetrating into and withdrawing from the web, with the distance between the outermost portion of the needles and the surface of the corresponding opening being restricted in the range from about 0.5 to 9 millimeters, whereby needle punching is carried out wherein a multiplicity of fibers penetrate substantially perpendicularly into said web.

3,859,699

CUTTING TOOL

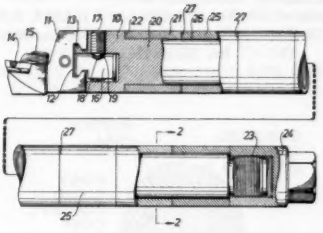
Bo Gosta Lindskog, Sandviken, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden

Filed Nov. 15, 1973, Ser. No. 415,987

Claims priority, application Sweden, Dec. 12, 1972, 16154/72

Int. Cl. B26d *1/00*

U.S. Cl. 29—96 **4 Claims**



1. Machine tool for internal cutting, which includes

a bar (**10**), and an interchangeable and adjustable cutting head (**11**) provided with an attached cutting insert (**14**), applied to the front end of the bar,

the bar (**10**) consisting essentially of an elongated support member (**20**) of steel and an outer tube-shaped shaft (**21**) of hard metal arranged to be prestressed via the mentioned support member by means of an adjustable tensile device (**24**);

the hard metal shaft (**21**) consisting of several, generally uniform, rings or cases (**25**) the inner diameter of which is 70–90 percent, preferably 75–85 percent, of the outer diameter,

the inner surfaces (**27**) of the cases lying close to the support body (**20**) carrying the cutting head (**11**).

3,859,700

INSERTED BLADE CUTTER

Richard Robert Jilbert, Chicago, Ill., assignor to Illinois Tool Works, Inc., Chicago, Ill.

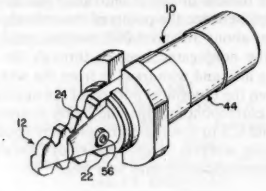
Filed May 7, 1974, Ser. No. 467,758

Int. Cl. B26d *1/00*

U.S. Cl. 29—96 **11 Claims**

1. A cutting tool assembly including a holder and removable cutting blade, the tool holder including a slot extending longitudinally from one extremity thereof, the slot terminating in a base portion which includes a pair of accurately machined flat locating surfaces disposed on intersecting planes, the cutting blade including longitudinally extending cutting edge means adapted to extend radially of the tool holder beyond the longitudinal edges of the slot when positioned therein, the base of

the blade including a pair of accurately machined flat locating surfaces disposed on intersecting planes, the locating surfaces of the blade and the slot forming complementary, mating abutment means, threaded fastening means extending through



the apices of the mating surfaces and adapted to clamp the blade and holder together, fastening means extending transverse the slot to clampingly retain the blade between the sides of the slot.

3,859,701

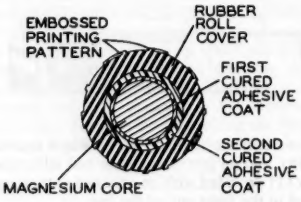
BONDING OF RUBBER TO MAGNESIUM AND ITS ALLOYS

Raymond B. Huber, Willow Street, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Division of Ser. No. 225,432, Feb. 11, 1972, Pat. No. 3,802,989. This application Dec. 26, 1973, Ser. No. 427,919

Int. Cl. B21b *31/08*

U.S. Cl. 29—132 **2 Claims**



1. A printing roll comprising an outer patterned and cured synthetic rubber cover, an etched inner magnesium core, and layers of cured adhesive interposed between said outer cover and inner core, said layers of adhesive comprising a first-cured impermeable barrier layer bonded to said magnesium core, and a second-cured layer of the same adhesive interposed between and bonding said impermeable layer to said rubber cover, the composition of said adhesive layers comprising a phenol-formaldehyde resin and a butadiene-acrylonitrile copolymer.

3,859,702

METHOD FOR ASSEMBLING ROLLER BEARING REMOTE CONTROL CABLES

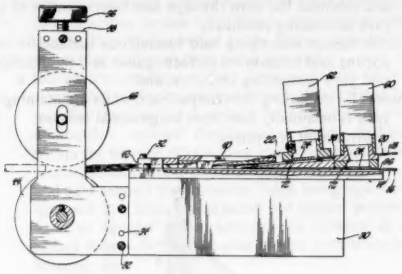
Sheldon E. Perlman, Wyncote, and John C. Ion, Doylestown, both of Pa., assignors to Teleflex Incorporated, North Wales, Pa.

Division of Ser. No. 348,411, April 5, 1973, Pat. No. 3,831,249. This application Apr. 1, 1974, Ser. No. 457,077

Int. Cl. B23p *11/00*

U.S. Cl. 29—148.4 A **2 Claims**

1. A method for fabricating a roller bearing remote control cable comprising: providing a plurality of aligned balls, feeding an elongated ball separator strip adjacent said plurality of aligned balls, permitting said balls to load said elongated ball separator strip, providing a second plurality of aligned balls, feeding a second elongated ball separator strip adjacent said



second plurality of aligned balls, and permitting said balls to load said second elongated ball separator strip.

3,859,703

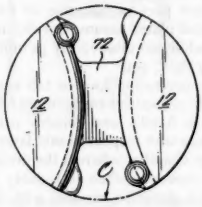
METHOD FOR MAKING A CHECK VALVE FOR A PUMP

H. Alfred Eberhardt, Paoli, Pa., assignor to Hale Fire Pump Company, Conshohocken, Pa.

Division of Ser. No. 206,340, Dec. 9, 1971, Pat. No. 3,726,308. This application Dec. 18, 1972, Ser. No. 316,035

Int. Cl. B21k *1/20*

U.S. Cl. 29—156.7 R **1 Claim**



1. A method of making at least two valves, each valve comprising an arcuate wall portion having a pair of parallel top and bottom end surfaces which lie in a circumference of a common circle and a pair of generally oval-shaped side wall portions disposed generally transversely to said arcuate wall portion from opposite side edges thereof, consisting of the steps of casting the valves simultaneously so the arcuate wall portions are connected by at least one connecting web, and the side wall portions of each valve lie in parallel planes and the outer edges of the side walls lie on the circumference of a common circle, thereafter, finish grinding the top and bottom end surfaces and the outer edges of the side walls, and separating the valves at the connecting web generally flush with the arcuate wall portion.

3,859,704

WHEEL MANUFACTURE

Carl Nasson, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed July 3, 1969, Ser. No. 838,915

Int. Cl. B21h *1/02*; **B21k** *1/32*

U.S. Cl. 29—159.01 **5 Claims**

1. The process of producing a vehicular wheel comprising providing a wheel rim and a wheel spider adapted to be inserted into and attached to the wheel rim, the interior of said wheel rim being a surface of revolution, the portions of said wheel spider to be attached to the wheel rim being also surfaces of revolution and dimensionally complementary to the wheel rim, the clearance between the wheel rim and the complementary portions of the wheel spider being no greater than

can be spanned effectively by a resinous adhesive, applying a resinous adhesive to either the wheel rim or wheel spider on the surfaces to be joined, inserting the wheel spider into the

steel rim, forcing the wheel rim into peripheral mechanical interlocking engagement with the wheel spider and permitting the resinous adhesive to cure.

3,859,705

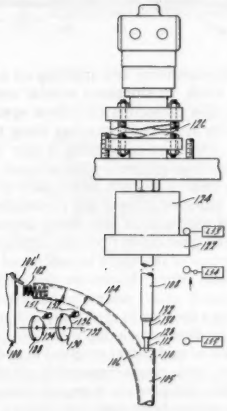
MACHINES FOR THE MANUFACTURE OF SPRING ASSEMBLIES

Donald O. Dulude, and Paul H. Winbigler, both of Coldwater, Mich., assignors to Kuhlman Corporation, Troy, Mich.

Division of Ser. No. 331,750, Feb. 13, 1973, , which is a division of Ser. No. 203,534, Dec. 1, 1971, Pat. No. 3,782,708. This application Nov. 23, 1973, Ser. No. 418,685

Int. Cl. B23p *19/00*

U.S. Cl. 29—200 B **32 Claims**



1. A machine for manufacturing a spring assembly having a base and a plurality of springs disposed on and extending in spaced parallelism from the base comprising a spring coiler, an assembly location, securing means at said location for securing the springs to the base, and feeding means extending from said coiler to the assembly location for feeding the successive springs from the coiler directly to said assembly location, said feeding means comprising tube mans having a first portion disposed proximate said spring coiler, a second portion in spaced proximity to said assembly location and having a longitudinal axis perpendicular to the surface of the base, and an entryway between said first and said second portions, and in which said securing means comprises a tool selectively movable along its own longitudinal axis from a position exterior to said tube means through said entryway and into said second portion of said tube means, with said longitudinal axis of said tool being essentially coaxial with the longitudinal axis of said second portion.

21. A machine for manufacturing a spring assembly having a base and a spring extending substantially perpendicularly to the base and having an end-turn portion secured thereto comprising a member having an aperture therein accepting a completed spring, a tool, means for moving the spring and said tool relative to one another for moving the spring from the aperture in said member and disposing the spring on and in surrounding relationship to a portion of said tool, means for moving the base and said tool with the spring thereon relative to one another for moving the spring into engagement with the base, and means including said tool for securing the end turn portion of the spring to the base.

29. A machine for manufacturing a spring assembly having a base and a plurality of springs secured on and extending in spaced parallelism from the base comprising spring coiler means for automatically forming complete separate coil springs, an assembling apparatus for securing the coil springs and automatically securing the springs on the base, and control means controlled by said assembling apparatus for controlling the operation of said spring coiler means.

3,859,706

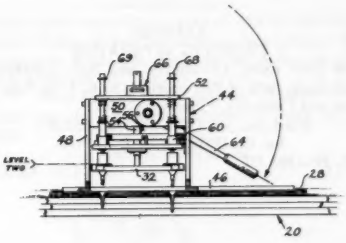
DEVICE FOR EXTRACTING PREVIOUSLY DRIVEN PROBE ELEMENTS FROM A SOLID STRUCTURE

Lon A. Williams, Wareham, and Walter L. Reid, Jr., Mattapoisett, both of Mass., assignors to Dole Electro-Systems, Incorporated, Palo Alto, Calif.

Filed July 5, 1973, Ser. No. 376,549

Int. Cl. B23p *19/00;* **B25b** *27/02;* **B23p** *19/04*

U.S. Cl. 29—200 D **13 Claims**



1. A tool for simultaneously withdrawing a plurality of probe elements from a planar structure into which they were previously driven, said tool comprising:

a fixed base adapted to lie flush against the surface surrounding a receptacle base unit supporting the probe elements to be withdrawn;

a frame attached to and extending upwardly from said base;

an extraction plate movable relative to said frame;

means on said extraction plate for locking it to said receptacle base unit;

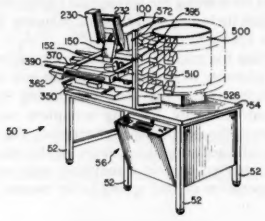
an actuator arm fixed to said extraction plate and extending upwardly;

and drive means connected to said actuator arm for moving it upwardly, thereby applying a lifting force to said extraction plate and to the attached receptacle base unit.

3,859,707
ELECTRONIC COMPONENT SEMI-AUTOMATIC ASSEMBLY MACHINE

Phillip A. Ragard, Binghamton, and James W. Paton, Johnson City, both of N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed Oct. 30, 1973, Ser. No. 411,044
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 B **22 Claims**

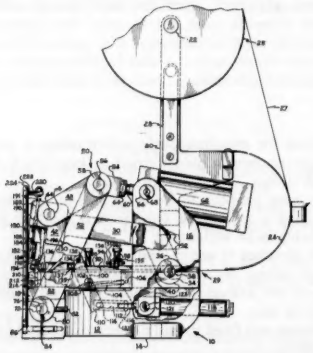


1. A machine for processing electrical components whose leads are to be manually inserted through a work piece disposed in a plane comprising:
- means for positioning said work piece in said plane;
- means for indicating a location on said work piece at which said component's leads are to be inserted;
- means for indicating the supply source of the component to be inserted;
- means for holding said inserted component on said work piece;
- means for cutting and clinching said component's leads; and control means operable to actuate said positioning means, said location indicating means and said supply indicating means, whereby the source and location of the component to be manually inserted on the positioned board is indicated.

3,859,708
CRIMPING APPARATUS

Kenneth John Keim, Lewisberry, and Dirk Landman, Mechanicsburg, both of Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 14, 1974, Ser. No. 433,377
Int. Cl. H01r *43/04;* **B21j** *9/18*
U.S. Cl. 29—203 DT **10 Claims**

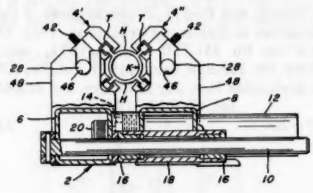


1. An apparatus for applying terminals to the ends of wires comprising,
- a base having a crimping station for receiving a terminal and a wire,
- crimp means connected to said base and a tool mounting block disposed thereon,
- first drive means connected to said crimp arm for crimping said terminal on said wire,
- feed means for supplying terminals to said crimping station, second drive means connected to said feed means, and
- control means for sequentially activating said first and second drive means and simultaneously deactivating said first and second drive means.

3,859,709
APPARATUS FOR EXPANDING AND APPLYING A JACKET TO A SPLICED SECTION OF AN ELECTRICAL CABLE

Eugene V. Abarotin, Murrysville Borough, and Robert A. Wilshire, Jr., Monroeville Borough, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 326,928, Jan. 26, 1973, abandoned. This application Jan. 23, 1974, Ser. No. 435,930
Int. Cl. B23p *19/04, 19/02*
U.S. Cl. 29—203 D **8 Claims**



1. Apparatus for expanding and applying on a spliced section of electrical cable an elongated tubular resilient jacket having peripheral fins projecting therefrom spaced substantially ninety degrees apart and extending along the length of said jacket, said apparatus comprising a pair of elongated independent symmetrical gripper bodies adapted to be spaced opposite to and parallel with each other, each of said gripper bodies including pairs of gripper jaws extending along its length, the jaws of each pair of jaws being disposed substantially ninety degrees apart offset from the normal planes passing through the center of the space between said pair of gripper bodies when said gripper bodies are disposed opposite to and parallel with each other, means for selectively adjusting the distance between the jaws in each pair, said gripper bodies being adapted to be disposed on opposite sides of one of said jackets with the fins of said jacket received in and clamped by said pairs of jaws, and means removably attached to said gripper bodies when said jaws are in engagement with the fins of said jacket for relatively moving said gripper bodies laterally away from each other in a planar motion to thereby expand said jacket for receiving said spliced section of cable and toward each other to thereby contract said jacket on said spliced section of said cable.

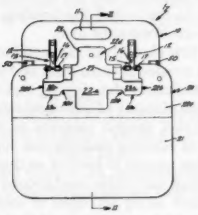
3,859,710
GARMENT LOADER FOR HANGERS

John H. Batts, and Judd F. Garrison, both of Grand Rapids, Mich., assignors to John Thomas Batts, Inc., Zeeland, Mich.

Filed Sept. 13, 1973, Ser. No. 397,087
Int. Cl. B23p *19/02*
U.S. Cl. 29—235 **25 Claims**

1. A loader for securing hangers to garments, the hangers having a clamp for gripping the garment, the clamp having at least one movable jaw and a locking member slidable toward the open end of said jaw to lock it in closed, garment-securing position, said loader comprising: a closure element; said clo-

sure element having jaw-engaging and closing means and locking member engaging and displacement means; said jaw engaging and closing means and said locking member engaging and displacement means being mounted for sequential operation with said jaw-engaging means first forcing said jaw into closed position and said locking member means next sliding said locking member into jaw locking position.



3,859,711

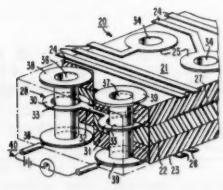
METHOD OF DETECTING MISREGISTRATION OF INTERNAL LAYERS OF A MULTILAYER PRINTED CIRCUIT PANEL

Dewfred R. McKiddy, Endwell, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 20, 1973, Ser. No. 343,057

Int. Cl. G01r *31/02*

U.S. Cl. 29—593 **6 Claims**



1. In the construction of a printed circuit panel having a pair of external circuit planes and at least one internal circuit plane, each said plane having electrical conductors on an insulative substrate, the method of determining vertical alignment of said planes, comprising the steps of:

designating predetermined through-hole locations on one of said external circuit planes;

forming an electrically conductive path on said internal circuit plane defining acceptable limits of misregistration at at least one of said through-hole locations of said second plane relative to said external plane;

stacking said external planes with said internal planes so that said internal plane is enclosed between said external planes;

laminating said stacked planes to form a unitary structure;

forming through-holes in said laminate at said designated through-hole locations on said external plane;

coating the surface of said hole with a conductive material; and

performing an electrical continuity test between said hole coating and said conductive path to determine whether said stacked planes are within the limits of permissible misregistration.

3,859,712

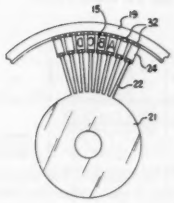
METHOD OF MAKING PRINTING DISC

Herbert Tramposch, Riverside, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Nov. 8, 1973, Ser. No. 413,782

Int. Cl. B23p *17/00*

U.S. Cl. 29—418 **4 Claims**



1. A method of making a printing disc for use in a serial printing apparatus, comprising the steps of:

a. making a disc-type member containing a font of print characters annularly arranged thereon;

b. removing material from said disc-type member to produce a double annular ring member having an outer and an inner ring with individualized character segments disposed between said rings;

c. removing said inner ring from said double annular ring member.

d. molding a flexible plastic disc member having a hub and flexible arms radially extending from said hub;

e. bonding each of said individualized character segments to a corresponding flexible arm to form a printing disc composite assembly; and

f. removing said outer ring from said composite assembly.

3,859,713

METHOD OF MANUFACTURING SLOTTED SIEVES

Bernhard Fiedler, Grevenbroich, Germany, assignor to Maschinenfabrik Nuckau R. Wolf Aktiengesellschaft, Grevenbroich, Germany

Filed June 25, 1973, Ser. No. 373,439

Claims priority, application Germany, June 26, 1972, 2231269

Int. Cl. B23p *17/00*

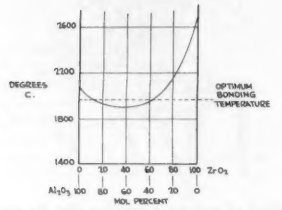
U.S. Cl. 29—423 **13 Claims**

1. A method of manufacturing a slotted sieve, comprising the steps of coating each of a plurality of elongated elements with a layer of soluble material; juxtaposing said elements so that they together assume the shape of the desired sieve and so that said layers of each two adjacent elements abut one another; interconnecting said adjacent elements; and removing said layers so as to obtain between said elements respective gaps which are adapted to serve as sieve openings.

3,859,714
BONDING OF SAPPHIRE TO SAPPHIRE BY EUTECTIC MIXTURE OF ALUMINUM OXIDE AND ZIRCONIUM OXIDE

John J. DeLuca, Silver Spring, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 12, 1973, Ser. No. 322,997
Int. Cl. B23k 31/02
U.S. Cl. 29—472.7 10 Claims

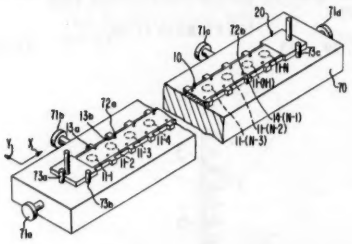


1. A method of bonding an element comprising a material selected from the group consisting of sapphire, ruby and blue sapphire to another element of such material comprising forming a eutectic mixture of aluminum oxide and zirconium oxide at an interface between surfaces of the elements to be bonded, and then cooling the same to a temperature below the eutectic temperature.

3,859,715
SYSTEM AND METHOD FOR ATTACHING SEMICONDUCTOR DICE TO LEADS

Edward F. Duffek; Ernest J. Funk, both of Cupertino; Alfred S. Jankowski, San Jose; Jack C. Lane, Saratoga; William L. Lehner, Los Altos Hills; Floyd F. Oliver, Los Altos, and Mark Schneider, San Jose, all of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Division of Ser. No. 99,904, Dec. 21, 1970,. This application Sept. 4, 1973, Ser. No. 394,038
Int. Cl. B01j 17/00
U.S. Cl. 29—588 10 Claims



1. The method of attaching leads to semiconductor dice which comprises:

placing a first plurality of semiconductor dice in a jig so that said dice are uniformly spaced along said jig, each die in said plurality of dice possessing a multiplicity of bonding pads on one surface thereof and each die being placed in said jig so that said multiplicity of bonding pads are visible;

placing a first lead set containing a plurality of groups of leads adjacent said dice, each group of leads containing a selected number of leads;

moving the leads in said first lead set into alignment with the bonding pads on the underlying dice by use of an adjustable aligning means so that each bonding pad has directly above and adjacent it a lead;

pressing said leads against said adjacent bonding pads;

heating said jig containing said first plurality of semiconductor dice and said first lead set to bond the leads in said first lead set to the underlying bonding pads on said first plurality of semiconductor dice;

removing said first plurality of semiconductor dice with said first lead set bonded thereto from said jig without changing the adjustment of the aligning means;

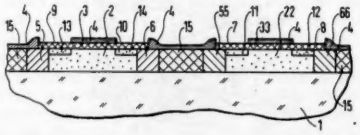
placing a second plurality of semiconductor dice in said jig, each die in said second plurality of dice possessing a multiplicity of bonding pads on one surface thereof and each die being placed in said jig so that said multiplicity of bonding pads are visible, said second plurality of semiconductor dice being arranged in said jig in the same orientations and locations as said first plurality of semiconductor dice; and

placing a second lead set, which is substantially identical to said first lead set, containing a plurality of groups of leads adjacent and in alignment with said second plurality of semiconductor dice by use of said adjusted aligning means, therefore insuring without readjustment of the aligning means that each bonding pad in said second plurality of semiconductor dice has directly above and adjacent it a lead.

3,859,716
PRODUCTION OF THIN LAYER COMPLEMENTARY CHANNEL MOS CIRCUITS

Jeno Tihanyi, Neuried, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sept. 24, 1973, Ser. No. 400,329
Claims priority, application Germany, Sept. 29, 1972, 2247975
Int. Cl. B01j 17/00
U.S. Cl. 29—571 14 Claims



1. In a process for the production of thin layer complementary channel MOS circuits in which semiconductor zones are applied in the form of islands to an electrically insulating substrate, in which these semiconductor zones are provided with regions exhibiting different doping, and in which a gate insulator layer is applied to the island-like semiconductor zones, for transistors, the improvement which comprises the steps of

A. applying a gate electrode layer of electrode material over both the gate oxide layers and the exposed surfaces of the semiconductor zones,

B. first etching first selected areas of said gate electrode layer above at least one semiconductor zone of one dopable type to remove in first selected areas said electrode material therefrom,

C. first implanting by ion implantation a doping concentration of ions of a first ion type in said first so etched selected areas,

D. secondly etching second selected areas of said gate electrode layer above at least one semiconductor zone of complementary type relative to said semiconductor (zone(s) of said one dopable type to remove in said second selected areas said electrode material therefrom, and

E. secondly implanting by ion implantation ions of a

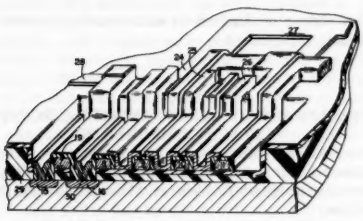
seocond ion type in said second so etched selected areas without further masking of said first selected areas, said ions of said second ion type resulting in a doping which is opposite to that produced by said first ion type, said second implanting being sufficient to produce an ion concentration sufficient to dope but being in a concentration which is less than the concentration of said first ion type in said first so etched selected areas.

3,859,717

METHOD OF MANUFACTURING CONTROL ELECTRODES FOR CHARGE COUPLED CIRCUITS AND THE LIKE

Robert D. Green, and Gary L. Heimbigner, both of Anaheim, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 21, 1970, Ser. No. 99,944
Int. Cl. B01j *17/00*
U.S. Cl. 29—571 **4 Claims**



1. A process for producing adjacent electrodes on an insulation layer over a semiconductor substrate, said process comprising the steps of:

forming separated, polycrystalline semiconductor strips comprising a first group of electrodes on said insulation layer;

joining certain of said semiconductor strips to provide a common input line to said joined strips;

forming an insulating layer over said separated semiconductor strips by a process which does not change the thickness of said first insulation layer and which permits portions of said first insulating layer to remain exposed between adjacent second insulating layers;

forming a plurality of conducting metal strips, each metal strip being disposed upon an exposed portion of said first insulating layer and overlapping two adjacent semiconductor strips and insulated therefrom by said second insulating layer; joining certain of said conducting metal strips to provide a common input line to said joined conducting metal strips;

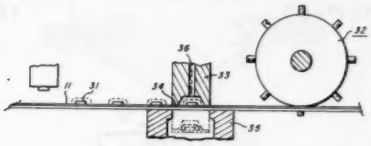
forming a field effect transistor simultaneously with the formation of said semiconductor strips and said conducting metal strips, said transistor using one of the semiconductor strips as a control electrode whereby the source and drain regions of said field effect transistor are equally spaced on both sides of said control electrode and one of said regions provided the source of carriers for an adjacent electrode for enabling the substrate region subjacent said electrode to be inverted in the presence of input signals.

3,859,718

METHOD AND APPARATUS FOR THE ASSEMBLY OF SEMICONDUCTOR DEVICES

Terry Wayne Noe, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 2, 1973, Ser. No. 320,349
Int. Cl. B01j *17/00*
U.S. Cl. 29—591 **6 Claims**



6. In the fabrication and assembly of a semiconductor device, wherein a semiconductor chip is attached to a thin-film interconnect pattern supported by a portion of a flexible dielectric film strip, and wherein said portion of the film strip is separated from the strip for bonding said interconnect pattern to a lead frame, the improved method for so separating and so bonding comprising the steps of:

pressing a punch member and a shearing die in contact with opposite sides of said portion of the film strip, in mated relationship, thereby punching out the said portion of the strip;

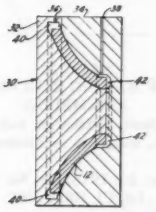
then bringing said punch member, with the punched-out portion of said film in place thereon, in contact with said lead frame and in contact with a bonding tool aligned therewith to complete said bonding of the interconnect patttern to the lead frame.

3,859,719

METHOD OF MAKING A TOROIDAL CORE-COIL COMBINATION WITH IN SITU MOLDED END RINGS

Ernest Gostyn, El Paso, Tex., and Francis J. Fratar, Springfield, Mass., assignors to General Instrument Corporation, Newark, N.J.

Filed Nov. 12, 1973, Ser. No. 414,978
Int. Cl. H01f *7/06*
U.S. Cl. 29—605 **11 Claims**



1. The method of making a toroidal core-coil combination comprising the steps of

A. providing a toroidal body formed of magnetic material and having a central opening therethrough and ends;

B. molding in situ onto each of said ends an end ring of insulating plastic material which substantially covers at least the axially exposed surface of the corresponding body end;

C. forming registering grooves in an exposed surface of each of said end rings; and

D. winding a wire conductor around said body in turns which are received in and circumferentially located by said grooves, the dimensions of said grooves being so related to the dimensions of said conductor as to permit such winding and enable such location of said turns.

3,859,720

METHOD OF MANUFACTURING MEMORY STACKS

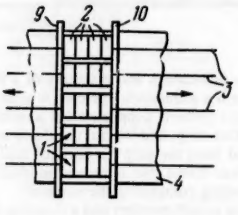
Jury Alexandrovich Burkin, 29, kv. 24 Tsretroi proezd, and Jury Emelyanovich Seleznev, 4-A, kv. 16. Vesenny proezd, both of Novosibirsk, U.S.S.R.

Filed Dec. 27, 1973, Ser. No. 428,860

Claims priority, application U.S.S.R., Dec. 27, 1972, 1869968

Int. Cl. H01f 7/06

U.S. Cl. 29—604 1 Claim



1. A method for manufacturing memory stacks, comprising the steps of: stringing a plurality of pole cores upon each of a plurality of wires, said wires extending in a first or "X" coordinate direction disposed on a frame and the cores on each of the wires forming piles; arranging the piles in a row, wherein they are parallel and equidistant to one another; mounting the thus arranged row upon an elastic substrate having at least one adhesive surface, by pressing the row against the adhesive surface; stretching the elastic substrate in a direction parallel to said first coordinate direction, thus separating the pole cores in the piles from one another so that pole cores are arranged upon the elastic substrate in parallel rows of the first or "X" coordinate direction intersecting with other parallel rows of a second or "Y" coordinate direction formed by the same pole cores; threading the pole cores in the second coordinate direction with a coiled wire, whereby a memory matrix row is produced to be stacked in the memory stack being manufactured.

3,859,721

METHOD OF MAKING ELECTRIC HEATER ASSEMBLIES

Donald M. Cunningham, Pittsburgh, and Ralph Santorc, Verona, both of Pa., assignors to Emerson Electric Co., St. Louis, Mo.

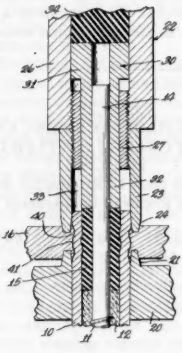
Filed Dec. 26, 1973, Ser. No. 427,823

Int. Cl. H05b 3/00

U.S. Cl. 29—611 4 Claims

1. The method of assembling a sheathed electric heating element with a mounting member which supports the heating element on the wall of a container, said element comprising a metal tube, a resistance member within said tube and insulating means within said tube for electrically insulating said resistance member from said tube, metal terminal pins electrically and mechanically connected to respective ends of said resistance member within said tube and projecting outwardly from respective tube ends, an elastomeric bushing within at least one end of said tube and fitting therein and about the terminal pin thereat with close tolerance, and said mounting member being formed of metal and having a hole therethrough for closely receiving said one tube end, the improved method comprising:

applying axial pressure to said bushing to force its peripheral surface against the inner wall of said tube one end and deforming metal adjacent to said tube one end and



the surface of the hole in said mounting member into sealing engagement.

3,859,722

METHOD OF DIP-SOLDERING PRINTED CIRCUITS TO ATTACH COMPONENTS

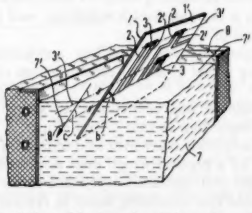
Siegfried Kinsky, Mitterndorf; Jan Segaert, Munich; Max Matuschek, Munich, and Wolfgang Koeppe, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed June 8, 1973, Ser. No. 368,318

Claims priority, application Germany, June 9, 1972, 2228218

Int. Cl. H05k 3/34

U.S. Cl. 29—626 6 Claims



1. A method of dip-soldering circuit boards such as ceramic substrates which carry thin or thick film circuits and components comprising the following steps:

a. arranging all of the film circuit portions which are to contact said components parallel to each other,

b. arranging all of the longitudinal axes of the components parallel with one another with opposite ends on the film circuits and such that the longitudinal axes of said components are at right angles to said portions of said film circuits,

c. coating those portions of said film circuits which are not to be wetted with solder with a solder-repellant substance in the proximity of the areas of contact with said components, and

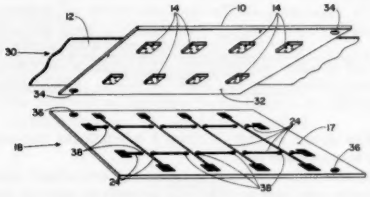
d. dipping said circuit board into a solder bath with an orientation such that the longitudinal axes of said components are parallel to the surface of said bath.

3,859,723

BONDING METHOD FOR MULTIPLE CHIP ARRAYS

Colin A. Hamer; Alberto Loro, and John R. Payne, all of Ottawa, Ontario, Canada, assignors to Microsystems International Limited, Montreal 101, Quebec, Canada

Filed Nov. 5, 1973, Ser. No. 413,168
Int. Cl. B23k *19/00*; H01l *7/00*
U.S. Cl. 29—626 20 Claims



1. A method of bonding a plurality of flip-chips, with predetermined orientations and at predetermined locations, to a metallization pattern on a supporting surface of a substrate, each flip-chip having a circuit face with bonding terminals thereon and a back face, said method comprising the steps of;

a. preparing a thin substantially flat metal template by adhering a flexible high-temperature-resistant tape to one surface of said template, said template being perforated by a plurality of substantially rectangular openings spaced and oriented in accordance with the desired spatial relationship and arrangement of the flip-chips on the supporting surface of said substrate, said template having a thickness less than the thickness of any one of said flip-chips, said tape overlying said openings to form a substantially rectangular pocket or well with an adherent bottom at each of said openings;

b. placing each of said plurality of flip-chips within a corresponding well in said template, with the back face of said each of said flip-chips in adherent contact with the adherent bottom of said corresponding well to form an assembly;

c. inverting said assembly and placing the other surface of said template over the supporting surface of the substrate;

d. registering said template with said substrate such that said plurality of flip-chips lie over said substrate at said predetermined locations whereat the bonding terminals of said flip-chips register with the metallization pattern on said substrate;

e. heating said metallization pattern and all the bonding terminals of a flip-chip and bonding said flip-chip to the metallization pattern on said substrate;

f. removing said tape from said one surface of said template and from the back faces of said flip-chips after all the flip-chips have been bonded to the metallization pattern on said substrate and thereafter withdrawing said template from said substrate.

3,859,724

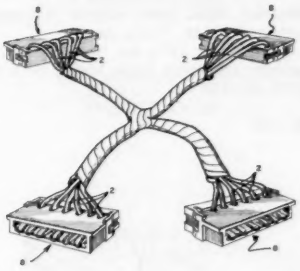
METHOD AND APPARATUS FOR MANUFACTURING ELECTRICAL HARNESSES

Earl Earnest Folkenroth, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 4, 1973, Ser. No. 347,957
Int. Cl. H01r *43/00*
U.S. Cl. 29—628 12 Claims

4. The method of manufacturing an electrical harness of the type comprising a plurality of multi-contact electrical connectors having electrical contact terminals therein, said terminals having conductor-receiving slots, said conductors being received in said slots, said method comprising the steps of:

mounting a plurality of jig means on a panel board in positions relative to each other which correspond to the positions of said connectors relative to each other in the finished harness, each of said jig means being of the type having means for holding one electrical connector in a predetermined position, conductor holding means for holding a plurality of conductors in alignment with the contact terminals in said connectors and tool mounting means for disengageably mounting a conductor trimming and inserting tool thereon,



lacing conductors between said jig means along paths corresponding to the conducting paths desired in said harness and locating portions of said conductors in said wire holding means of said jig means,

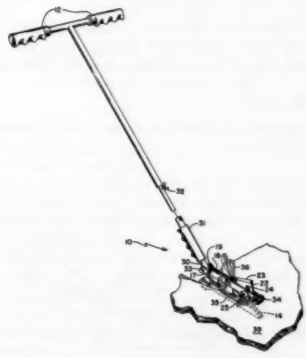
mounting a conductor trimming and inserting tool on each of said jig means and actuating said tool and thereby trimming said conductors and inserting said conductors into said slots to mechanically and electrically connect said conductors to said terminals.

3,859,725

CARPET CUTTING TOOL

Lloyd E. Anderson, 3123 Upton Ave., North, Minneapolis, Minn. 55412, and Gilbert L. Alinder, 5312 Shoreview Ave., South, Minneapolis, Minn. 55417

Filed Jan. 8, 1973, Ser. No. 321,774
Int. Cl. B26b *3/08*
U.S. Cl. 30—294 10 Claims



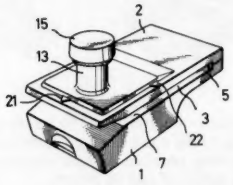
1. A carpet cutting tool comprising first and second spaced jaw members defining a carpeting receiving opening therebetween, means holding said jaws in spaced relationship, a comb member adjustably joined to one of said jaw members with a portion of said comb extending into the region intermediate the jaws, said comb being adjustable so as to vary the angle its lower edge forms with said jaws, the rear portion of said comb which extends into said jaw region defining a slot along a part of the length thereof for receiving a cutting blade edge, a cutting blade mounted to at least one of said jaws and extend-

ing at least partially across said opening with the cutting edge thereof slanted rearwardly from the carpet receiving opening between said jaws, the rearward portion of the cutting edge of said blade extending into said slot in said comb.

3,859,726
LETTER PUNCH

Tetsuya Mitsunari, Niiza, Japan, assignor to Toppan Moore Business Forms Co. Ltd., Tokyo, Japan

Filed May 1, 1974, Ser. No. 465,831
Claims priority, application Japan, May 7, 1973, 48-53421; Dec. 28, 1973, 49-4228
Int. Cl. B26f *1/32*
U.S. Cl. 30—358 **7 Claims**

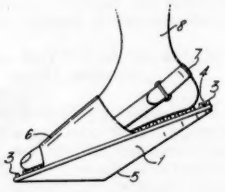


1. A letter punch which comprises a base and an upper plate which are disposed in parallel to each other leaving a horizontal gap to receive documents to be punched therein and are connected at the side edges and end edges thereof forming a side wall and an end wall, respectively, and said upper plate being provided with a spring-actuated punch rod and said base being provided with a base plate having a punch hole to cooperate with said punch rod.

3,859,727
FOOTWEAR CONTAINING FOOT MASSAGE MEANS

Hideru Nakamoto, 1-110 Menoshima Tooseicho, Aridashi, Japan

Filed Aug. 10, 1972, Ser. No. 279,518
Claims priority, application Japan, Aug. 10, 1971, 46-71443; Sept. 18, 1971, 46-85256; Oct. 29, 1971, 46-10164
Int. Cl. A43b *3/12*; **A61f** *5/14*
U.S. Cl. 36—11.5 **6 Claims**

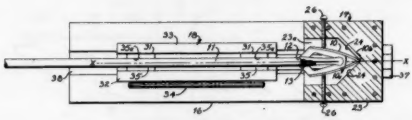


1. An item of footwear comprising a sole having an insole and an outsole, said outsole resembling an inverted triangle with the base thereof adapted to face the bottom of the foot of the wearer, thereby enabling the foot to pivot about the apex of said inverted triangular outsole, the height of the apex of said inverted triangular outsole above the base of said outsole being sufficient to cause a see-saw action around said apex and an alternate shifting of the weight of the wearer from the heel to the toe of the foot.

3,859,728
ARROWHEAD SETTING DEVICE

George F. Shutt, 1210 N.E. 181st St., Apt. 26, Tacoma, Wash. 97230

Filed Sept. 24, 1973, Ser. No. 399,940
Int. Cl. A63b *65/02*; **G01b** *5/25*
U.S. Cl. 33—180 R **6 Claims**



6. The device set out in claim **1** wherein the last-named means is comprised of:

a support member fixed between the arrowhead support means and base to hold said arrowhead support means against movement along said prescribed axis;

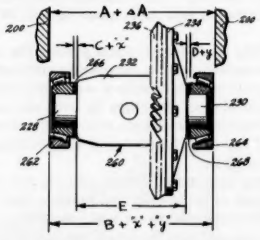
a slide fixed to the shaft support means; and

a way formed within the base slidably receiving the slide, said way being parallel to said prescribed axis whereby said slide and shaft support means are permitted free movement relative to said arrowhead support means, along said prescribed axis.

3,859,729
JIG MEASURING TOOL AND USE OF THE SAME

Richard D. Pfeiffer, 410-102nd, S.E., No. 4, Bellevue, Wash.

Continuation-in-part of Ser. No. 828,610, March 28, 1969, Pat. No. 3,703,769. This application Apr. 19, 1971, Ser. No. 134,987
Int. Cl. G01b *3/38*
U.S. Cl. 33—181 AT **18 Claims**



1. A jig measuring tool for securing rapid and accurate clearance measurement, said tool comprising:

a. a first member of a generally annular configuration whose outside diametrical dimension is substantially the same as but slightly less than the interior diametrical dimension of a bearing assembly bore and in which bore said first member will be positioned;

b. said first member having a center line and said center line being the center line of said outside diametrical dimension and said center line also substantially coinciding with the center line of said bearing assembly bore when said first member is positioned in said bore;

c. said first member with its generally annular configuration having a first central bore;

said center line of said first member being the center line of said first central bore;

e. a second member of a generally annular configuration;

f. said second member with its generally annular configuration having a second central bore;

g. said second member having a center line and said center line being the center line of said second central bore;

h. said first member and said second member mate with each other and are capable of adjustment relative to each other along said center lines;
i. a first means to fixedly position said first member and said second member with respect to each other;
j. said first member and said second member comprising said tool;
k. said tool having a central bore having an interior diametrical dimension substantially the sme as but slightly larger than the exterior diameter dimension of the first bearing surface on which the tool will be positioned so as to provide a rotatable clearance between said tool and said first bearing surface; and,
l. said tool having a width approximately equal to the width of a bearing asssembly for which said bearing assembly said tool will be temporarily substituted in said bearing assembly bore and on said bearing surface.

3,859,730

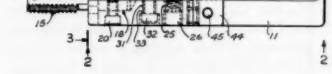
SCREW THREAD GAGE USING DRAG FOR TESTING

Stanley G. Johnson, West Hartford, Conn., assignor to The Johnson Gage Company, Bloomfield, Conn.

Continuation-in-part of Ser. No. 841,227, July 14, 1969, abandoned. This application Oct. 23, 1970, Ser. No. 83,276

Int. Cl. G01b *3/00, 3/40, 3/48*

U.S. Cl. 33—199 R **5 Claims**



1. A screw thread gage for internal (or external) screw threads using three degrees of frictional drag by turning the gage or the test part one on the other for accepting or rejecting a test thread comprising a single pair of gaging members including a first member and a second member spaced from each other providing a slot therebetween, the slot permitting contraction (for internal thread gaging members) and expansion of the (for external thread) gaging members for axially positioning of the gaging members on the test thread, each gaging member having a cooperating thread gaging surface thereon, connecting and spring means securing the gaging members together for parallel or substantially parallel movement and resiliently pressing the gaging members in a direction to engage the test thread, precisely located and fixed stop means carried by one member and engaging the other member and limiting expansion of said gaging members, (having gaging surfaces for internal threads and limiting contraction of gaging members having gaging surfaces for external threads) the precise location of the stop means being at (one of) the maximum limiting tolerance dimension(s) of the test thread at which setting the frictional drag solely is used and is light for an acceptable thread, the stop means providing a sharp cut-off of spring means pressure for a test thread larger than (and providing a cut-off side of) this limiting dimension and (on which side) no drag is felt, and the resiliency of the connecting and spring means being such that a heavy frictional drag is felt when the test part or gage is turned one on the other with a test part (outside of) smaller than the minimum tolerance limit, and (being engaged by the gaging members on the spring means pressure side of the stop means) including lock means selectively engaging the second gaging member to lock the same against the stop means.

3,859,731

METHOD FOR DETERMINING THE POSITION OF A CAMERA FROM A PHOTOGRAPH TAKEN THEREBY AND DEVICE FOR PERFORMING THE SAME METHOD

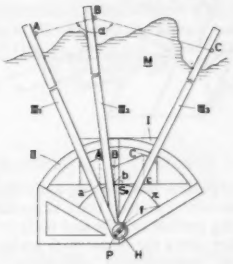
Hidetomo Endo, Tokyo, Japan, assignor to Kyokuto Chosa - Sekkei Co. Ltd., Tokyo, Japan

Filed May 2, 1973, Ser. No. 356,606

Claims priority, application Japan, May 9, 1972, 47-45047

Int. Cl. G01c *21/20;* **G01b** *21/02*

U.S. Cl. 33—227 **8 Claims**



6. A method as claimed in claim **5,** wherein there are at least three known reference points on one photograph.

3,859,732

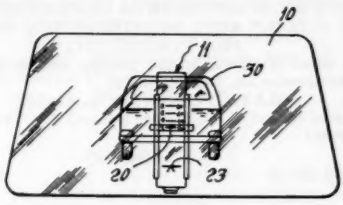
PRECEDING MOTOR VEHICLE OBSERVATION SPACING GUIDE

John Joseph Davin, R.D. 2, Box 214, Troy, N.Y. 12182

Filed Feb. 29, 1972, Ser. No. 230,384

Int. Cl. G01c *21/00*

U.S. Cl. 33—264 **7 Claims**

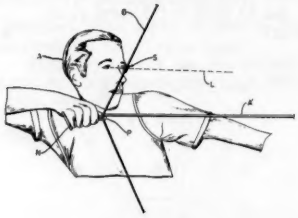


1. In a motor vehicle, an improvement in an apparatus for ascertaining the separation distance of a preceeding vehicle therefrom, of which comprises:
slide support carrier means (carrying for releasable movement) including a pair of spaced apart longitudinal channel members each having an aligned recess for slidably receiving therebetween,
a slide member of transparent material having scribed thereon a plurality of spaced apart horizontal lines, and a lowermost reference mark,
means provided on said support means for fixedly holding said slide member in said channel members at selectable positions, and
means for fixedly serving said support means to the windshield of said motor vehicle in the line of sight of the operator, and the slide being selectively positioned in said support means in said line of sight which includes in alignment, said reference mark and the top of the hood of said motor vehicle, whereby the operator may ascertain the separation of his vehicle from said preceding vehicle by observing between which of said horizontal lines a structural portion of said proceding vehicle appears.

3,859,733
ARCHERY PEEP SIGHT

John C. Chesnick, 4070 Marshall St., Wheatridge, Colo.

Filed Dec. 26, 1973, Ser. No. 427,918
Int. Cl. F41g *1/00*; F41b *5/00*
U.S. Cl. 33—265 11 Claims

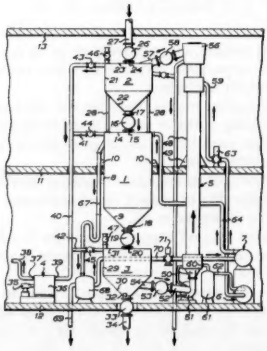


1. In a peep sight adapted for mounting on an archery bowstring wherein a unitary body is provided with a bowstring-receiving portion to affix said body to the bowstring in spaced relation above the arrow nock positioning area of the bowstring, the improvement comprising a sight opening formed centrally of the body and extending therethrough, said sight opening having an axis normally extending along an angle of inclination with respect to an axis normal to the bowstring receiving portion which is substantially equal to the angle of displacement of the bowstring away from vertical when the bowstring is drawn to its cocked position so that the sight axis will be in the line of sight of the archer when the bowstring is drawn to the cocked position for releasing an arrow.

3,859,734
METHODS AND PLANTS FOR DRYING MATERIAL IN LIQUID SOLID, SUSPENDED OR GRANULATED FORM, E.G. BLOOD-PLASMA, DIGESTED SLUDGE, FORAGE, FISH, CEREALS, ETC.

Lars Osten Wahlgren, Malmo, Sweden, assignor to Sintab Swedinventor AB, Malmo, Sweden

Filed Jan. 17, 1974, Ser. No. 434,008
Claims priority, application Sweden, Jan. 18, 1973, 7300680[illegible]
Int. Cl. F26b *3/00*
U.S. Cl. 34—9 23 Claims

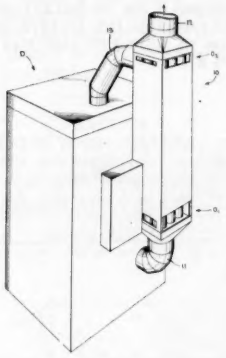


1. A method of drying material in liquid, solid, suspended or granulated form, such as blood-plasma, digested sludge, forage, fish, cereals, and the like, including the steps of feeding the material into a drying zone maintained under subatmospheric pressure, introducing into the zone a drying medium including a large number of separate elements of high specific heat at a temperature higher than that of the material, mixing said medium and said material to permit the drying medium to yield its heat to the material in order to boil away the the moisture of the material at the subatmospheric pressure to expel moisture from the material without injuriously raising its temperature, condensing the moisture and removing the condensed moisture from the drying zone and discharging simultaneously the drying medium and the material from the drying zone and separating said medium from said material.

3,859,735
DRYER PREHEATER

Herman E. Katterjohn, Jr., 1021 Kentucky Ave., Paducah, Ky. 42001

Filed Jan. 23, 1974, Ser. No. 435,652
Int. Cl. F26b *19/00*
U.S. Cl. 34—86 6 Claims

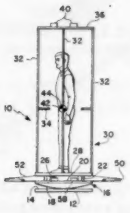


1. In a preheater for use with a dryer for clothes or the like including an elongated shell housing having a heat exchange chamber, and an exhaust air plenum assembly including air intake means for receiving moisture laden heated exhaust air from the dryer at one end of the housing, air discharge means for the cooled moisture laden exhaust air at the opposite end, baffle means across said chamber at each end defining said intake and discharge means and said chamber therebetween, and a plurality of elongated heat exchange tubes supported and sealed by said baffles serving to pass said exhaust air through said heat exchange chamber, an output passage extending from said chamber at a position intermediate said ends of said housing to feed preheated air to said dryer, the improvement comprising an inlet orifice means extending substantially around the full periphery of said housing and communicating with said chamber at both ends and adjacent said baffles for directly introducing ambient air to be heated, said orifice means being so positioned substantially around the periphery so as to allow full scrubbing contact of incoming ambient air with the end surface area of all tubes substantially immediately upon entry into said chamber and to provide transverse air flow intersection around the end surface area of said tubes in said chamber to generate turbulence, the heated air from both ends further coming into scrubbing contact with the remainder of the tube surface area and longitudinally intersecting at said intermediate position along said chamber to generate further turbulence, whereby maximum heat exchange efficiency between incoming ambient air and the full tube surface area is attained.

3,859,736
KINESTHETIC CONTROL SIMULATOR

Paul R. Hill, and David F. Thomas, Jr., both of Hampton, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 20, 1970, Ser. No. 29,979
Int. Cl. G09b *9/08*
U.S. Cl. 35—12 C **3 Claims**

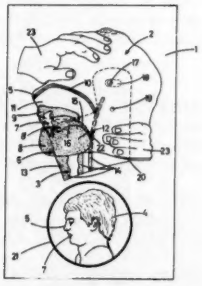


1. A kinesthetic control simulator comprising:
support means having a spherical lower surface;
base means for support of said support means;
a platform mounted in spaced relation to said support means for supporting an operator;
framework means extending upwardly from said platform; and
means for vertically positioning the center of gravity of the simulator and an operator above, below and corresponding to the center of rotation of said spherical lower surface wherein said means for vertically positioning includes column means for spacing said platform from said support means and for vertically positioning the center of gravity of the simulator and an operator relative to the center of rotation of said spherical lower surface whereby the simulator may simulate a stable, unstable and neutrally stable flying platform.

3,859,737
DEVICE FOR USE IN TEACHING FIRST AID

Asmund S. Laerdal, Stavanger, Norway

Filed Jan. 22, 1973, Ser. No. 325,744
Claims priority, application Germany, July 12, 1972, 25917
Int. Cl. G09b *23/32*
U.S. Cl. 35—17 **2 Claims**



1. A device for teaching artificial respiration, comprising: a panel, and first and second planar elements only, said first planar element being pivotably mounted on said panel so as to be movable parallel to the panel and representing the side view of a human head with an upper lip but without a lower lip and having marked thereon a tongue, and said second planar element being pivotable with respect to said first planar element and representing the side view of a neck and the lower lip of a human head and having marked thereon a windpipe, one of said elements at least partly overlying the other and being at least in part transparent and having darkened areas, said two elements being interconnected and pivotable between a first position in which the lips appear closed and the windpipe blocked by the tongue and a second position in which the lips and windpipe appear open.

3,859,738
VEHICLE PARKING INSTRUCTION CURB DEVICE

Joe Heaton, 120 W. Washington St., Tipton, Ind. 46072

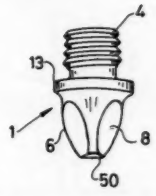
Filed Oct. 30, 1973, Ser. No. 411,112
Int. Cl. G09b *9/04*
U.S. Cl. 35—11 **15 Claims**

1. A vehicle parking instruction device comprising:
A. a base including means extending laterally thereof as a support for a simulated curb;
B. a simulated curb resiliently suspended apart from said base and above a parking surface;
C. at least one pressure sensitive element supported upon said parking surface adjacent said curb; and
D. signal means connected to said pressure sensitive element as an indicator of the student vehicle tire position with respect to said curb.

3,859,739
GRIPPER ELEMENTS FOR SPORTS SHOES

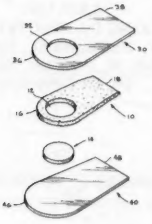
Adolf Dassler, D-8522 Herzogenaurach am Bahnhof, Herzogenaurach, Germany

Filed May 16, 1973, Ser. No. 360,815
Claims priority, application Germany, May 24, 1972, 2225143; May 24, 1972, 2225144
Int. Cl. A43c *15/00*
U.S. Cl. 36—67 D **4 Claims**



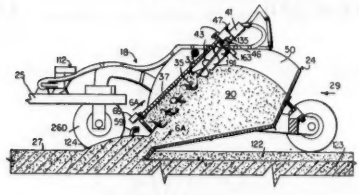
1. A gripper element for a sports shoe, such as a shoe for use on plastic tracks, said gripper element comprising a body having a first end and a second end, a longitudinal axis extending between said ends, said second end being adapted to be secured to the outsole of a sports shoe, a conical outer surface to said body whereby said body is narrower at said first end than at said second end, further comprising means defining longitudinally extending grooves, circumferentially spaced around said body, the depth of said grooves increasing gradually from said first end to a point approximately centrally of said first and second ends, and then gradually decreasing, and further comprising a flat end surface substantially perpendicular to said longitudinal axis at said first end, whereby the ends of said grooves adjacent said first end form gripper edges with said end surfaces and the ends of said grooves nearer said second end form support surfaces.

3,859,740
CUSHION HEEL PAD FOR SPUR HEELS
James A. Kemp, 7447 Southway, Houston, Tex. 77017
Filed Jan. 23, 1974, Ser. No. 435,729
Int. Cl. A43b *19/00*
U.S. Cl. 36—71 10 Claims



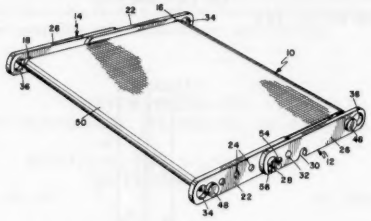
1. A cushion pad for heel spurs comprising a layer of soft and compressed fabric, said layer having an opening through the thickness thereof and being contoured to fit inside the user's shoe in the heel area thereof, and an insert in said hole of soft and resilient material.

3,859,741
EARTH MOVING PROCESS
Robert L. Reinhardt, P.O. Box 2451, Lubbock, Tex. 79401
Continuation of Ser. No. 345,225, March 26, 1973, abandoned, which is a division of Ser. No. 257,638, May 30, 1972, Pat. No. 3,738,028. This application Mar. 4, 1974, Ser. No. 447,724
Int. Cl. E02f *1/00*
U.S. Cl. 37—8 7 Claims



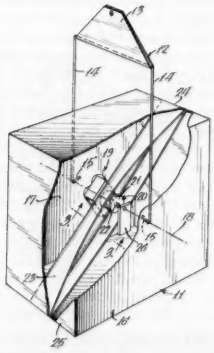
1. In the process of moving an earth severing means in a path across an earth surface, severing an upper layer of earth from earth below the surface of said layer, moving the severed earth particles into a transport means therefor and transporting the severed earth particles in a first forward direction, the improvement which comprises the steps of continuously containing and evenly driving the severed earth particles rearwardly to the rear of the transport means at one site while blocking movement of all particles thereof in an upward path transverse to the direction of said driving and out of said transport means and pulverizing particles of such severed mass and positively and evenly distributing such particles in said transport means and automatically expanding the transverse cross-section of the flow path of the driven material along the entire length of the driving thereof and automatically expandinng the top and bottom portions of the entrance orifice of the flow path of said driven material as the pressure of such particles so driven increases.

3,859,742
NEEDLECRAFT FRAME
Alfonso Amaro, 3641 Fireway Dr., San Diego, Calif. 92111
Filed Jan. 17, 1974, Ser. No. 434,052
Int. Cl. D06c *3/08*
U.S. Cl. 38—102.4 7 Claims



1. A needlecraft frame including adjustable frame sides for stretching and holding a canvas on rollers, taut and accessable from both sides, and wherein the improvement comprises:
paird first and second side arms having a pivotal interconnection adjacent the inner ends thereof and having roller receiving keyhole slots adjacent the outer ends thereof,
said keyhole slots comprising a narrow opening through said side arms connecting with an enlarged opening through said side arms,
said narrow opening extending from said enlarged opening along said side arms toward said inner ends of said side arms,
a pair of elongated rollers,
each of said rollers having at least two parallel flats adjacent the ends thereof,
said flats being spaced a distance substantially equal to the spacing between the narrow portion of said keyhole slots and having a major dimension less than the diameter of said enlarged opening.

3,859,743
TUMBLING DISPLAY DEVICE
Alois F. Schoenung, Naperville, Ill., assignor to Rapid Mounting and Finishing Company, Chicago, Ill.
Filed Jan. 21, 1974, Ser. No. 434,820
Int. Cl. G09f *11/00*
U.S. Cl. 40—33 11 Claims



1. A tumbling display device comprising:
an outer display member having a center of gravity and support means at opposite sides of said center of gravity;
means for supporting said display member for rotation about an axis defined by said support means;

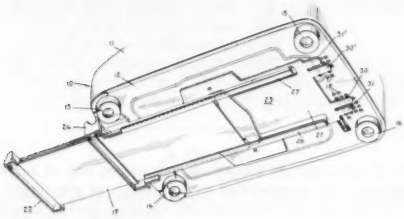
a motor including first and second portions, said second portion being rotatable relative to said first portion;
means for mounting the first motor portion to said display member for rotation about said axis;
and an eccentric weight carried by said second motor portion having its center of gravity spaced below said axis whereby energization of said motor causes said first portion to rotate relative to said second portion with said second portion being maintained substantially stationary as a result of the inertia of the eccentric weight.

3,859,744

TELEPHONE INDEX DEVICE

Hedley Nixon Holmes, 36 Roundwood Ct., Agincourt, Ontario, Canada

Filed Mar. 4, 1974, Ser. No. 447,777
Int. Cl. G09f *3/00*
U.S. Cl. 40—336 **10 Claims**



1. An index device for use with a telephone of the type having a generally rectangular base having front and rear edges, the base having an underside formed with an array of holes adjacent the rear edge and being mounted on supporting feet including a pair of laterally spaced feet adjacent the front edge,
the device comprising
an elongated drawer-like slide member adapted to carry index sheets, and a generally flat frame member constructed to support the slide member along the underside of the telephone base in drawer-like sliding manner therewith,
the frame member comprising an elongated body portion of such a width as to extend between said pair of laterally spaced feet, a pair of lateral abutment portions adapted to engage said pair of feet, and a rearwardly extending flexible strap formed with an upwardly projecting resilient stud positioned to engage one of said holes when said abutment portions are located in abutting engagement with said pair of feet and adapted to snap into the hole to secure the frame member to said underside.

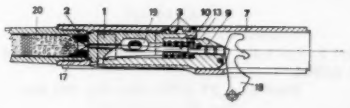
3,859,745

HUNTING GUN WITH FLOATING BOLT PROVIDED WITH A DEVICE FOR LOCKING THE BOLT HEAD IN THE BOLT BREECH UPON FIRING

Giovanni Benelli, Urbino, Italy, assignor to Benelli S.p.A. Divisione Armi

Filed July 16, 1973, Ser. No. 379,604
Claims priority, application Italy, July 18, 1972, 27099/72
Int. Cl. F41c *11/06;* **F41d** *3/06*
U.S. Cl. 42—16 **6 Claims**

1. A hunting gun having a cartridge chamber and a breech extending along an axis including a cylindrical internal surface, said gun provided with a bolt assembly comprising a locking bolt head and a floating element adapted for axial movement in back and forth directions with respect to the locking bolt head and to unlock it during the movement in one of the two directions, and a spring interposed between said locking bolt head and said floating element, characterized in that said locking bolt head comprises a first surface provided with at least one projection adapted to engage in corresponding recesses provided in the cylindrical internal surface of the breech, a second surface adapted to engage a first mating surface of the floating element of the bolt assembly and to slide thereon during the initial inertial movement of the floating element so as to maintain said at least one projection of the first surface in the corresponding recesses of the second sur-



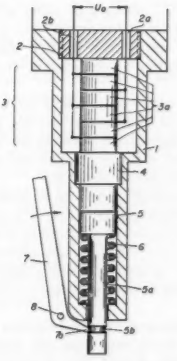
face, said two mating surfaces under these conditions being substantially parallel to the breech axis, and a third surface, said third surface being inclined with respect to the breech axis and adapted to engage a second mating surface of the floating element and to slide thereon during a next back direction movement of the floating element so as to permit said at least one projection to disengage from the corresponding recesses provided in the breech.

3,859,746

DEVICE FOR RELEASING AN INITIAL ELECTRIC IGNITION OF THE PROPELLANT CHARGE OF CARTRIDGES FOR HAND FIREARMS

Otto Pecksen, Herrenalb, Germany, assignor to Mauser-Werke Aktiengesellschaft, Oberndorf/Neckar, Germany

Filed Sept. 16, 1971, Ser. No. 181,276
Claims priority, application Germany, Oct. 3, 1970, 2048743
Int. Cl. F41c *19/12;* **F41f** *13/08;* **F42b** *5/08*
U.S. Cl. 42—84 **12 Claims**



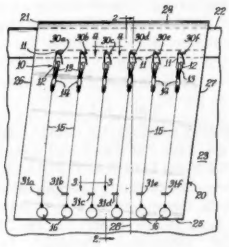
1. In a firearm constructed and arranged for firing cartridges each including a projectile, a propellant charge for the projectile, a detonator charge, for detonating the propellant charge, and said detonator charge having an electrode therein: a device for electrically igniting the detonator charge by applying a high potential voltage to such electrode comprising, in combination, a tubular housing; an anvil at one end of said housing, a piezo-electric voltage generator mounted in said housing and having one end engaging said anvil; manually releasable impact-producing means engaging the opposite end of said piezo-electric voltage generator and having a portion projecting from said housing; means engaging said projecting portion of said impact-producing means and operable to tension and release said impact-producing means to impact said piezo-electric voltage generator; and circuit means connecting

said piezo-electric voltage generator to the electrode in the detonator charge of a cartridge in said firearm; said piezo-electric voltage generator, when subjected to said impact by said impact-producing means, generating, in substantially 6.8 to 7 microseconds after impact, a voltage of substantially 2,800 Volts applied to said circuit means and sufficient to ignite said detonator charge to burn in a period of not more than 100 microseconds to detonate said propellant charge.

3,859,747
FISHING EQUIPMENT HOLDER

Robert J. Proebstle, 1222 E. Kensington, Arlington Heights, Ill. 60004

Filed Aug. 27, 1973, Ser. No. 391,994
Int. Cl. A01k *97/00*
U.S. Cl. 43—54.5 R **3 Claims**



1. An apparatus for holding a plurality of a given item of fishing tackle having an engaging portion at one end and a weight at the other end with a fishline therebetween, said engaging portion including a hook-shaped wire, said apparatus comprising:

a support having a top, a bottom and two ends and adapted to be mounted so that a vertical has approximately a predetermined orientation between the top and the bottom, said support including means for use in mounting said support with said orientation,

a first plurality of engaging devices adjacent the top of the support and secured thereto and a second plurality of engaging devices adjacent the bottom of the support and secured thereto, said engaging devices being arranged in pairs with a pair consisting of a top engaging device and a bottom engaging device, with respect to a pair of engaging devices:

the distance between the top and bottom engaging device of each pair being less than the distance from said engaging portion of said item to said weight,

the top engaging device being readily engageable and disengageable with said engaging portion, said top engaging device being a ring having a central opening for receiving said hook-shaped portion,

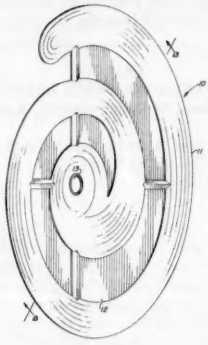
the bottom engaging device being offset in the direction of one of said ends from the vertical which extends downwardly from the top engaging device,

the bottom engaging device comprising a ring having a side thereof adjacent said vertical extending downwardly from the top engaging device, said ring having a central opening larger than the diameter of said fishline and a side aperture smaller than the central opening and larger than the diameter of said fishline for moving said line into and out of said central opening, said side aperture being spaced away from said adjacent side of said ring.

3,859,748
ROTATABLE TOY

Walter L. Blue, Mesa, Ariz., assignor to Herbethon Toy Corporation, Mesa, Ariz.

Filed Sept. 18, 1973, Ser. No. 398,481
Int. Cl. A63h *1/22*
U.S. Cl. 46—47 **4 Claims**



1. A rotatable toy having an unbalanced axis of rotation adapted to be manipulated by movement of the finger for developing manual dexterity and creating optical illusions, said toy comprising:

a. a substantially thin rigid sheet member;

b. means defining an aperture within said sheet member, said aperture being sized to accommodate a human finger therethrough to provide an axis of rotation for said sheet member; and

c. indicia defining a volute upon the face of said sheet member,

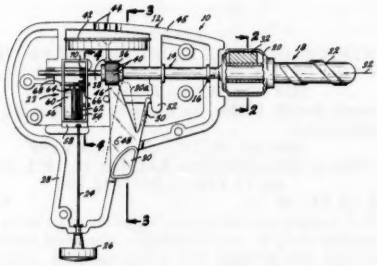
said aperture being concurrent with the origin of said volute, and

said sheet member having an outer edge defined by said volute.

3,859,749
POWER TOOL TOYS

Marius J. Morin; James D. Hegel, both of Torrance; Vere S. Hampy, Lawndale, and Richard L. Shield, Long Beach, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Dec. 18, 1972, Ser. No. 316,161
Int. Cl. A63h *33/30*
U.S. Cl. 46—39 **8 Claims**

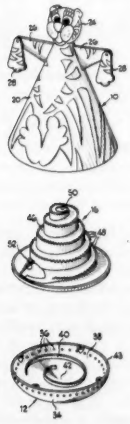


1. A toy simulating a power driven device with a moveable output member, comprising:

1. a housing of substantially the same shape as that of said power driven device;

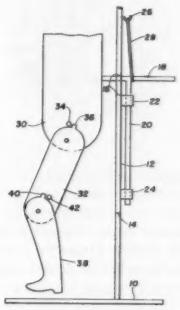
2. a motor mounted in said housing;
3. an output member moveably mounted on said housing and projecting therethrough, the output portion projecting out of the housing representing said output member in said useful power driven device and the output portion within the housing being coupled to the motor for movement thereby, at least one of said output portions including means for vibrating said housing when said output portions are moved, at least one of said output portions being rotatably mounted and carrying an eccentric weight for vibrating said housing;
4. a toothed member fixed to said output member within said housing; and
5. a manually operable trigger pivotably mounted on said housing and having a catch arm moveable into and out of engagement with said toothed member to control rotation of said output member, sais motor including:
A. a rotatably mounted string drum;
B. a pull string having an inner end on the drum and an outer end projecting through the housing;
C. a coil spring coupled to the drum; and
D. means coupling the drum to said output member, so that when the string is pulled and released the spring can rotate at least a portion of said output member.

3,859,750
FIGURE TOY
Robert S. McKay, Morton Grove, Ill., assignor to Marvin Glass Associates, Chicago, Ill.
Filed Aug. 27, 1973, Ser. No. 391,946
Int. Cl. A63h *29/08*
U.S. Cl. 46—42 **6 Claims**



1. An animated figure toy comprising: means defining a generally upright, doll-like figure; means providing a ground engaging convex bottom on said figure; a movable weighted object associated with said figure; and guide means secured to said figure for guiding said movable object from a relatively upper position within said figure to a relatively lower position within said figure in a path at least partially non-coextensive with the vertical projection of the center of gravity of said figure, said bottom and said guide means extending to either side of said vertical projection, whereby as said weighted object moves from said upper position to said lower position, said figure will rock on said convex bottom.

3,859,751
TOY DANCING PUPPET
George E. Leblanc, Iroquois Falls, Ontario, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed Jan. 4, 1974, Ser. No. 430,673
Int. Cl. A63h *13/02*
U.S. Cl. 46—138 **2 Claims**

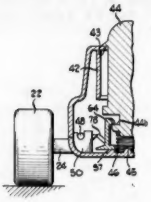


1. A toy comprising:
a horizontal base;
a vertical plate extending upward from the base, said plate having a vertically elongated slot, said plate further having guides;
first means including a horizontal member extending through said slot and a vertical member secured to the horizontal member, the plate guides constraining the movement of the vertical member and limiting same to an up and down motion;
second spring like means interconnecting the horizontal member to a point on the post above the slot to bias said horizontal member to a normal position at which it bears against the top end of the slot;
a vertical puppet body secured to said horizontal member; a first inclined elongated member pivotally secured at its upper end to the bottom end of the body; and
a second inclined member having a lower end shaped as a foot and pivotally secured at its upper end to the lower end of the first inclined member whereby pressing down of said horizontal member against the bias and then releasing the pressure will cause the body and inclined members to vibrate in a vertical plane, the upper ends of each of the inclined members having prongs which cooperate with stops disposed on the adjacent lower ends of the body and first inclined member respectively to produce the desired movements.

3,859,752
TOY VEHICLE HAVING MEANS FOR CANTING WHEELS ON COLLISION
Howard J. Morrison, Deerfield, and Donald F. Nix, Hanover Park, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed June 1, 1973, Ser. No. 365,952
Int. Cl. A63h *17/00*
U.S. Cl. 46—201 **8 Claims**

1. A wheeled toy vehicle comprising:
a body having a plurality of movable parts including a plurality of wheels mounted on axles for rotation relative to said body, and transverse pivot means associated with each axle for arcuate movement of the wheels from a normal rolling position to a canted dislocated position;
a unitary slide member, means mounting said slide member on said body for lengthwise sliding movement on impact from a normal position to a dislocated position relative to said body, said slide member including a portion exposed

on the exterior of the body in the form of a bumper element for moving the slide member to its dislocated position upon impact against the bumper element; and



blocking means associated with said slide member and said wheels for preventing movement of the wheels to canted position when the slide member is in its normal position, said blocking means being disengageable for permitting movement of the wheels to canted position upon movement of the slide member to its dislocated position.

3,859,753

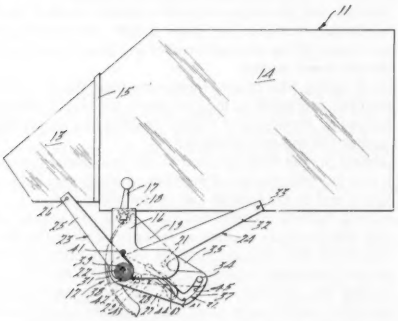
VEHICLE WINDOW REGULATOR MECHANISM

Anthony T. Marcuzzi, Windsor, Ontario, Canada, assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 17, 1973, Ser. No. 407,393

Int. Cl. E05f *5/12*

U.S. Cl. 49—103 **5 Claims**



1. A vehicle window regulator mechanism coupled to a window panel that is vertically divided into independently movable, substantially coplanar, visibility and ventilation sections,

the window regulator mechanism having a mounting plate, a gear sector pivotally mounted on a first pivot shaft carried by the mounting plate,

a first regulator arm freely swingable intermediate its ends on a second pivot shaft journalled in the mounting plate, the first regulator arm at one end being coupled to the ventilation section and at its other end having a cam slot, a second regulator arm fixedly coupled at one end to the second pivot shaft for swinging movement as the second shaft rotates in the mounting plate,

the second regulator arm being coupled at its other end to the visibility section,

the second regulator arm having an appendage having a cam slot therein,

and drive pinion means for rotating the gear sector about the pivot axis of the first pivot shaft,

wherein the improvement comprises:

a first and a second cam follower mounted on the gear sector for movement through equal angular degrees of rotation about the gear sector pivot axis upon rotation of the gear sector,

the first and second cam followers moving through the cam slots in the first and second regulator arms, respectively, so that upon rotation of the gear sector in window opening direction the ventilation section is lowered to a predetermined position before the visibility section is lowered and upon rotation of the gear sector in window closing direction the visibility section reaches a fully raised position before the ventilation section starts to rise,

the shift of movement from the one panel section to the other occurring at the same angular degree of rotation of the cam follower relative to the initial position of the followers in window closed position of the panel sections.

3,859,754

EXTRUDED PROFILE MEMBERS, PARTICULARLY OF A THERMOPLASTIC SYNTHETIC MATERIAL, FOR BLIND FRAMES AND SASHES OF SASH WINDOWS, SLIDING DOORS, OR THE LIKE

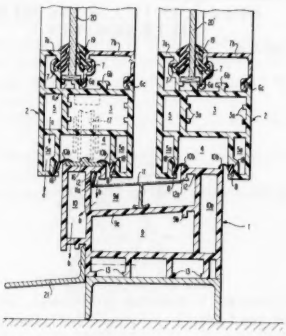
Wolfgang Budich; Robert Krah, both of Troisdorf-Sieglar, and Hans Theissen, Eschmar, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Aug. 31, 1972, Ser. No. 285,113

Claims priority, application Germany, Sept. 1, 1971, 2143698

Int. Cl. E05d *13/02*

U.S. Cl. 40—425 **11 Claims**



1. An arrangement of blind frame profile members and sash profile members for slidingingly supporting sash windows, doors, and the like; said arrangement comprising: a relatively fixed frame formed of identical cross-section frame profile members for all sides of the frame, at least one sash formed of sash profile members, said sash profile members including means for supporting a glass pane or the like, and guiding means for slidably guiding said sash in said frame,

wherein said at least one sash profile members are of identical cross-section for all sides of the sash, and

wherein said sash profile members project beyond the immediately adjacent frame profile member in a direction perpendicular to the plane of the glass pane or the like supported by the sash, said sash profile members including: a main sash channel, a side sash channel adjacent said main sash channel, two lateral sash channels forming a sash groove therebetween, and mounting guides for gaskets arranged on said lateral sash channels, wherein said frame profile members include a main channel and at least one side channel adjacent said main channel, said two lateral sash channels being in straddling engagement with said side channel, wherein said frame profile members include two side channels positioned in parallel relationship at opposite ends of said main channel, and wherein two sashes are provided, the sash profile mem-

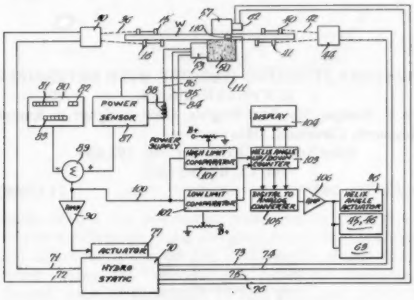
bers of the respective sashes each having their respective two lateral sash channels in straddling engagement with said side channels, wherein said profile members further include an undercut section for holding a facing profile member in position to conceal that portion of the profile members between the two sashes and facing toward the glass pane, and wherein said main channel includes four sidewalls enclosing a main channel space, one of said sidewalls being slanted with respect to an oppositely facing sidewall.

3,859,755

POWER PROGRAMMING SYSTEM FOR A CENTERLESS GRINDER

Robert L. Schaller, Camillus, N.Y., assignor to Sundstrand Syracuse, Inc., Syracuse, N.Y.

Filed May 4, 1973, Ser. No. 357,390
Int. Cl. B24b *3/18*
U.S. Cl. 51—103 TF **11 Claims**



1. A power programming system for a centerless grinder having a grinding element, means for feeding a workpiece relative to the grinding element at a selected rate of speed within a variable range of speeds including a regulating wheel and a variable speed drive unit, drive means for the grinding element including a motor, variable means for setting the desired power consumption, means for sensing the power consumption of said motor, and means for continuously comparing the desired power consumption and the actual power consumption and controlling said variable speed drive unit of the workpiece feeding means to have the workpiece travel at a rate to cause the motor to consume power at the set rate during the entire grinding operation.

3,859,756

METHOD AND DEVICE FOR GRINDING THE END FACES OF CYLINDRICAL BODIES, PARTICULARLY OF ROLLERS FOR ROLLING BEARINGS

Giorgio Zerbola, Torino, Italy, assignor to Riv-Skf Officine di Villar Perosa S.p.A., Torino, Italy

Filed Oct. 17, 1972, Ser. No. 298,224
Claims priority, application Italy, Nov. 3, 1971, 70623/71
Int. Cl. B24b *7/04*
U.S. Cl. 51—118 **5 Claims**

1. A device for grinding the flat end faces of cylindrical bodies comprising:

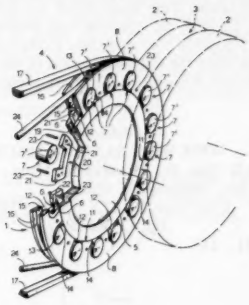
a rotatable transport member for carrying said bodies along a substantially circular path between two rotary grinding wheels disposed one in front of the other;

first actuating means for effecting rotation of said transport member at a first predetermined angular speed variable within a predetermined range;

an internal cylindrical rotatable rolling track for said bodies coaxial with said transport member;

second actuating means for effecting rotation of said internal rolling track at a second predetermined angular speed variable within a prefixed range;

an external cylindrical rotatable rolling track for said bodies, coaxial with said transport member; and



third actuating means for effecting rotation of said external rolling track at a third predetermined angular speed variable within a predetermined range;

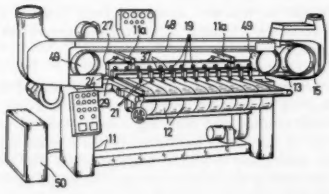
Whereby the ratio between the angular speeds of said internal rolling track and said external rolling track can be selected so that rotation of said cylindrical bodies takes place substantially without sliding between said bodies and said rolling tracks.

3,859,757

GRINDING MACHINE WITH BELTS

Karl Heesemann, 54 Friedenstrasse, 4970 Bad Oeynhausen-Rehme, Germany

Filed Feb. 1, 1973, Ser. No. 328,737
Claims priority, application Germany, May 9, 1972, 2222616
Int. Cl. B24b *21/08*
U.S. Cl. 51—138 **6 Claims**



1. A belt grinding machine comprising a grinding belt, a flexible pressure member for pressing an operative portion of said belt from a normally maintained inactive position downwardly against a workpiece conveyed in a first direction beneath said operative portion of said belt, said pressure member extending transversely of said first direction entirely across the width of the surface of the workpiece to be ground, a plurality of double acting, fluid pressure motors each having a first and a second internal chamber divided from each other by a piston having a rod projecting from the first chamber end of sad motor, the rods of said motors being connected to said pressure member at spaced locations transversely of said first direction and operable upon actuation of the associated motor to raise or lower the section of said pressure member connected thereto, a first pressure source commonly connected to all of said first chambers to urge said pistons and the connected pressure member toward a position of maximum elevation wherein said grinding belt is in said inactive position, a

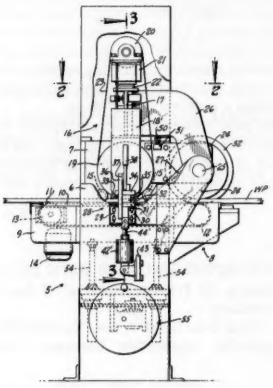
second pressure source maintained at a pressure higher than that of said first source, valve means on each motor operable to selectively connect the second chamber of the motor to said second source or to vent, and delayed action control means associated with each motor engageable with a workpiece surface at a location upstream of the direction of movement of the workpiece from each motor for actuating said valve means to position the grinding belt beneath the associated motor at a position corresponding to the position of the control means when the engaged portion of the workpiece subsequently arrives in operative relationship with the grinding belt.

3,859,758

WIDE BELT SANDING MACHINE

Raymond G. Fair, Jr., Minneapolis, Minn., assignor to Timesavers, Inc., Minneapolis, Minn.

Filed June 7, 1973, Ser. No. 367,976
Int. Cl. B24b *21/04*
U.S. Cl. 51—147 **12 Claims**



1. A sanding machine comprising:

A. a main frame;

B. work conveying means in the main frame to carry work through the machine along a defined horizontal path;

C. a vertically oriented sanding head above said defined path having

1. an endless sanding belt,
2. a frame including a horizontally oriented center bar having an inboard end and an outboard end, and
3. belt guiding and carrying means mounted above and below the center bar on which the endless sanding belt is removably mounted and by which the belt is constrained to travel in a vertically oriented generally oval shaped orbit,

said belt guiding and carrying means including a backup member by which the sanding belt as it traverses the bottommost portion of said generally oval shaped orbit is pressed against a workpiece being carried through the machine by said work conveying means;

D. mounting means by which the sanding head is connected with the main frame of the machine for bodily up and down motion so that the weight of the sanding head applied through said backup member presses the sanding belt against the workpiece and the distance between the bottom of the orbit of the belt and the work conveying means can vary to accommodate variations in the level of the workpiece surface being sanded, said mounting means comprising:

1. pivot means on the main frame of the machine providing a pair of coaxial spaced apart fixed pivots, the common axis of which is parallel with the center bar of the sanding head, and lies outside the orbit of the sanding belt at an elevation between the top and bottom of the sanding head,
2. a pair of arms, each pivotally connected near one end thereof with one of said pivot means so that the free ends of said arms swing about said fixed axis,
3. means rigidly connecting one of said arms with the frame of the sanding head at a location near the inboard end of its center bar and laterally outward of the adjacent edge of the endless sanding belt, the other of said arms having its free end located below the level of the bottommost portion of said generally oval shaped orbit of the sanding belt so as not to interfere with removal and replacement of the belt, and
4. means forming a readily separable rigid connection between the free end of said other arm and the outboard end of the center bar; and

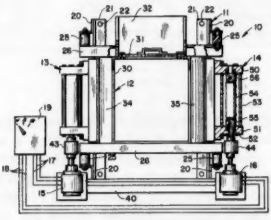
E. adjustable load supporting means reacting between the sanding head and the main frame of the machine to support part of the weight of the sanding head and thereby govern the pressure with which the sanding belt engages the work.

3,859,759

VIBRATORY FINISHING MACHINE WITH REVERSIBLE ECCENTRIC DRIVE

John F. Rampe, Mayfield Heights, Ohio, assignor to Rampe Research, Cleveland, Ohio

Filed Sept. 27, 1972, Ser. No. 292,657
Int. Cl. B24b *31/06*
U.S. Cl. 51—163 **11 Claims**



1. A finishing machine comprising:

a. a tub structure;

b. structure supporting said tub structure;

c. a reversible rotary vibratory drive interposed between said structures for vibrating said tub structure relative to said supporting structure;

d. means to reverse the rotation of said vibratory drive;

e. said vibratory drive including means to vibrate said tub structure in a first mode at a first amplitude; and

f. said vibratory drive also including means responsive to the direction of rotation of said drive to vibrate said tub structure in a second mode at a second amplitude larger than the first.

3,859,760

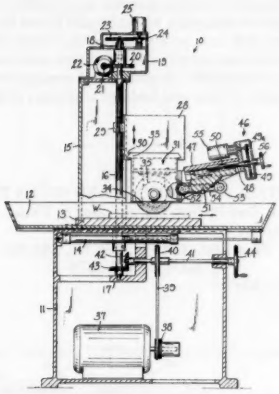
CONTROL SYSTEM FOR GRINDING MACHINE

Paul E. Grieb, 253 West St., Plantsville, Conn. 06479, and Richard Sieradzki, 6081 Atkins, Troy, Mich. 48084

Filed Dec. 21, 1972, Ser. No. 317,229
Int. Cl. B24b *49/02*; G05b *13/02*
U.S. Cl. 51—165.75 **4 Claims**

1. A surface grinder comprising a wheelhead arranged to drive a grinding wheel, means for moving said wheel-head and wheel in elevation above a reference plane, means providing a first train of pulses, resolver means coupled to said means for moving for generating a second train of pulses at the same frequency as said first train, means for comparing the phase

difference of the pulses of said first and second trains, means for providing a third train of pulses at a frequency substantially higher than pulses of said first and second trains proportional in number to the magnitude of the phase difference between pulses of said first and second trains and one direction of phase difference, and providing a fourth train of pulses of the same frequency as said third train proportional in magnitude to the magnitude of the phase difference between



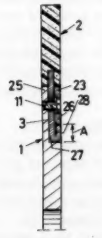
pulses of said first and second trains and the other direction of phase difference, pulse counting means for accumulating the difference in the number of the pulses of said third and fourth trains and establishing a numerical representation thereof, each of the pulses of said third and fourth trains representing an increment of distance between said wheel and said reference plane, and means for visually displaying the distance represented in said counting means.

3,859,761

SEGMENTAL GRINDING WHEEL

Gerhard Lutz, Schwaz, Austria, assignor to Tyrolit-Schleifmittelwerke Swarovski K.G., Schwaz, Austria

Filed Mar. 13, 1974, Ser. No. 450,855
Claims priority, application Austria, Apr. 2, 1973, 2884/73
Int. Cl. B24d *5/06*
U.S. Cl. 51—206.5 **4 Claims**



1. In a segmental grinding wheel, in particular an abrasive cut-off wheel, of the type including a supporting body and a plurality of abrasive segments supported to extend from the periphery of said supporting body, the improvement comprising:

said supporting body having at one edge of the outer periphery thereof a radially outwardly extending flange;

each of said segments having attached thereto a holding plate with a first side thereof abutted against said flange,

each of said holding plates having an inner end with a projection extending therefrom in a direction away from said flange and parallel to the longitudinal axis of said grinding wheel; and

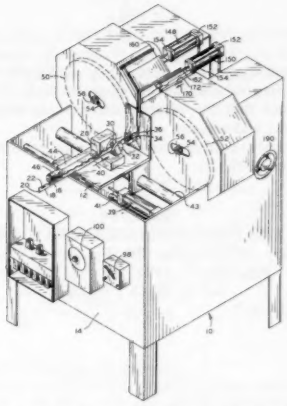
a clamping ring abutted against second sides of said holding plates, said clamping ring having an outer annular surface of the same diameter as that of said flange, said clamping ring having an inner annular surface spaced from the outer periphery of said supporting body, said projections of said holding plates extending between said inner annular surface of said clamping ring and said outer periphery of said supporting body.

3,859,762

PROCESS FOR GRINDING CUTTING EDGES ON BLADES

Clarence H. Ludwig, 816 W. Cherry St., Bluffton, Ind. 46714

Filed Apr. 5, 1973, Ser. No. 348,210
Int. Cl. B24b *1/00*
U.S. Cl. 51—285 **5 Claims**



1. A process for grinding cutting edges on blades comprising the steps of: clamping the blade at selected locations along the length thereof, grinding a cutting edge by holding the blade in a longitudinally fixed position while laterally displacing the blade against first one and then the other of two rotating grinding wheels one on each side of said blade and each profiled to have centrally disposed convexly shaped annular grinding surfaces of major dimension, a convex grinding surface of smaller dimension disposed immediately adjacent said central surface one on each side thereof, bringing the major and smaller dimension convex grinding surfaces against the surfaces of the blade at first one blade side and then the other blade side to effect a series of profiled cutting scallops with crest and valley sections and reversely directed cutting surfaces between each crest and each valley of the blade, and periodically longitudinally advancing successive blade sections for grinding action.

3,859,763

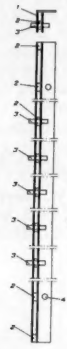
WALL RAILS FOR FIXING OF WALL PANELS AND FOR INTERIOR FITTINGS

Per Dahm, Varmlandsgatan 28, Goteborg, Sweden

Filed Nov. 10, 1969, Ser. No. 875,399
Claims priority, application Sweden, Nov. 12, 1968, 15507/68
Int. Cl. A47b *96/14;* **A47f** *5/08*
U.S. Cl. 52—36 **2 Claims**

1. Wall rail for fixation of wall panels and/or interior fittings such as shelves, pendant cupboards etc., characterized in that the wall rail has two essentially parallel shanks situated close

together with a flanged section roughly at right angles thereto and preferentially projecting only to one side, that the flanged section has fixing holes and is designed for attachment of the wall rail to an underlying wall or the like, that between the parallel shanks are arranged bracket-carriers at regular short



intervals and element-carriers at regular long intervals, that the longer interval consitutes a whole multiple of the shorter interval, and that the element-carriers are laterally stiffly displaceable; and wherein

every element-carrier is arranged in and encompassed by a bracket-carrier.

3,859,764

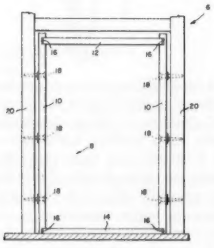
PLATE AND NON-REMOVABLE SCREW ASSEMBLY

Neal A. Cary, 3570 Fancher Rd., Fancher, N.Y. 14452

Filed May 7, 1973, Ser. No. 357,805

Int. Cl. E06b *1/08, 1/06*

U.S. Cl. 52—217 **1 Claim**



1. In a wooden door frame having an improved plate and non-removable screw assembly for adjustably positioning the door frame relative to fixed wooden studs, the combination comprising:

a wooden plate of said door frame having front and rear planar surfaces in which said door frame is positioned with said rear surface facing a fixed wooden stud;

said plate further defining a first opening extending through said plate from said front surface to said rear surface; and a substantially flat screw-retaining member having a plurality of transversely extending barbs insertable into said wooden plate for securing said member to said rear plate surface in substantially parallel relation thereto, said screw retaining member having a plurality of flexible lips extending substantially parallel to said plate, said lips having ends thereof lying in the same plane as said lips and facing and spaced from one another to define a second opening in register with said first opening for threadingly receiving a screw having a head engageable with said front plate surface and a shank extendable through said first opening and provided with a spiral thread and groove screwable through said second opening into the fixed wooden stud, said second opening having a diameter less than the maximum root diameter of the spiral groove of the screw threaded therethrough whereby said lips are flexed by the groove, and said screw further having a peripheral channel axially spaced from a surface of said head a distance substantially equal to the perpendicular distance between said front plate surface and said lips, said channel further defining a cylindrical neck having a diameter smaller than the spiral groove root diameter adjacent said neck whereby said flexed lips enter said channel and said screw cannot be removed from said plate when said screw is screwed into said plate with said head of said screw substantially in engagement with said front plate surface and said lips in register with said channel.

3,859,765

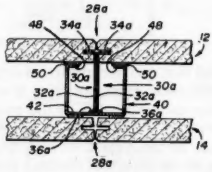
DEMOUNTABLE PARTITIONS AND STUDS THEREFOR

Nels Nelsson, Des Plaines, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Sept. 1, 1972, Ser. No. 285,762

Int. Cl. E04b *2/78*

U.S. Cl. 52—241 **5 Claims**



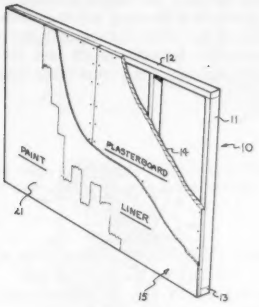
1. A demountable partition comprising:

1. lower runner means,
2. upper runner means,
3. two opposed rows of partition panels removably mounted within said lower and upper runner means, each row being defined by a series of adjacent pairs of panels having their opposed vertical edges generally in abutment to define a partition joint, some of said pairs of adjacent panel members being provided with kerfs along their vertical edges, the joints of one row being generally directly opposite the joints of the opposite row,
4. a plurality of first stud members intermediate said rows of partition panels, each comprising:
   a. a web portion engaging inner surfaces of adjacent partition panels of one row adjacent the joints therebetween,
   b. a pair of side flanges,
   c. a pair of space-apart terminal edge flanges engaging inner surfaces of adjacent partition panels of the other row adjacent said joint therebetween,
   d. attaching means securing said web portion to the inner surfaces of said panels, and
5. a plurality of second stud members each having:
   a. a central web extending into one of said first stud members,
   b. a terminal flange at one end of said web abutting the inner wall of the web portion of said first stud member and being secured thereto,
   c. a portion of said central web extending external of said first stud member, and
   d. oppositely directed flanges at the end of said central web external extending portion engaged in the kerfs provided in a pair of adjacent partition panels.

3,859,766
WALL STRUCTURE FOR MODULAR OR MOBILE HOMES

David W. Flotow, and John C. Young, both of Adrian, Mich., assignors to Simplex Industries, Inc., Adrian, Mich.

Filed Mar. 26, 1973, Ser. No. 345,129
Int. Cl. E04b *2/04;* B32b *21/06*
U.S. Cl. 52—268 1 Claim



1. In a wall structure for modular or mobile homes comprising:

A. a framework

B. plasterboard sheets fastened to the framework with the adjacent edges of adjacent sheets substantially in abutment to form plain unfinished joints, and

C. a liner adhered by adhesive to the outer face of the plasterboard sheets for providing ccomplete face coverage of the sheets from end to end and from side to side and including the said plain unfinished joints,

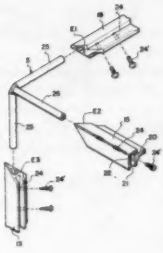
D. the improvement wherein said liner is a laminated sheet of five layers, the middle layer of the five layers being a core stock of kraft board of a weight of the order of 90 pounds, the two outermost layers being of hard sized, machine finished paper of the order of 50 pounds, and the two remaining layers comprising thermoplastic bonding layers respectively situated between the middle layer and each of the outermost layers, each bonding layer comprising a continuous waterproof film of flexible thermoplastic polyethylene resin, whereby the faces of the plasterboard sheets and the plain unfinished joints are covered to conceal same and to provide a smooth and uninterrupted exterior surface.

3,859,767
CORNER STRUCTURE IMPROVEMENT AND METHOD

John E. Aspenwall, Provo, Utah, assignor to Jahabow of Utah, Inc., Provo, Utah

Filed Oct. 31, 1973, Ser. No. 411,449
Int. Cl. F16b *5/00*
U.S. Cl. 52—280 5 Claims

4. A three-dimensional closed corner structure comprising first, second, and third elongate edge members, said edge members having mitered ends mutually abuttingly engaging each other and thereby forming of themselves a closed three-dimensional corner, each of said elongate members including indentations, adapted to receive translucent panels, and also a longitudinally oriented, spline-receiving cylindrical aperture; a three-legged reinforcing spline structure comprising first, second, and third cylindrical rod-like spline members, mutually forming an open corner and welded solely within said open corner, respectively disposed in said apertures and dimensioned to enable mutual abutment of said mitered ends of said edge members to self-form a closed corner; and screw means interior of said closed corner threaded into said edge members for fixedly securing said spline members thereto,

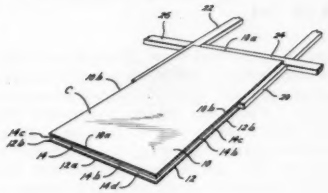


whereby to retain the corner formed by said edge members and said spline members intact.

3,859,768
PREFABRICATED TENNIS COURT ASSEMBLY

Byron A. Donzis, Houston, Tex., assignor to Flex-A-Court, Inc.

Filed Mar. 1, 1973, Ser. No. 336,992
Int. Cl. E04c *2/38*
U.S. Cl. 52—476 7 Claims



1. A court assembly, comprising:

a plurality of court units, each of which has a locking recess on each of its sides and ends, said plurality of court units being arranged in sets of three units side-by-side; and

a locking member adapted to be disposed in each pair of adjacent locking recesses on said units for positioning said units with all of their upper surfaces in the same plane, and at least one of said locking members for each of said sets in the longitudinal locking recesses being of the same length as said recesses, and another of said locking members being positioned in one of said locking recesses and extending therebeyond for positioning in a fourth unit in another set of units aligned therewith.

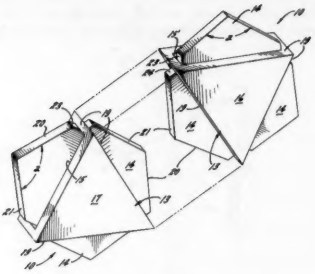
3,859,769
INTERLOCKING MODULES

Raymond L. Watkins, 1203 E. State St., P.O. Box 4313, Rockford, Ill.

Filed Dec. 11, 1972, Ser. No. 313,961
Int. Cl. E04c *1/10, 1/30;* A63h *33/08*
U.S. Cl. 52—588 7 Claims

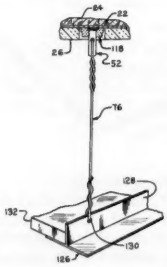
1. An interlocking module comprising a substantially planar body shaped as an equilateral triangle providing side edges and having first and second generally flat and parallel faces, a generally flat and substantially triangular tongue of predetermined thickness integrally formed with and projecting outwardly from each side edge of said body, each of said tongues extending substantially along the entire length of its associated edge and having an area approaching but not greater than one-third the area of one of said faces, a slot opening out of each edge of said body and each of said slots lying in a second common plane spaced between and extending generally paral-

lel with said first plane and said first face and being generally the same size, shape and thickness as one of said tongues, and



an internal reinforcing member extending generally between said faces.

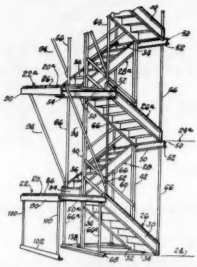
3,859,770
SUSPENSION SYSTEM
Harry A. Chambers, Amherst, and John C. Tillman, Hudson, both of Ohio, assignors to TRW Inc., Cleveland, Ohio
Filed Jan. 18, 1973, Ser. No. 324,737
Int. Cl. E04b *5/52, 5/62*
U.S. Cl. 52—741 **5 Claims**



1. A method of suspending an acoustical ceiling from an overhead structure, said method comprising attaching wires to weldable studs, placing each stud in a chuck of a stud welding tool, with the wire extending outwardly to one side of the stud in front of the chuck, placing the end of the stud in contact with the overhead structure, subsequently welding the studs to the overhead structure in selected positions, attaching portions of the supporting members to the lower ends of said wires to support said members in a common plane below said overhead structure, and placing acoustical panels on said supporting members.

3,859,771
PREFABRICATED MULTI STORY STAIR ASSEMBLY METHOD
Smith H. Simmons, Largo, and Mitchell R. Caraway, Tampa, both of Fla., assignors to The Standard Fabricated Products Co., Clearwater, Fla.
Division of Ser. No. 143,115, May 13, 1971, Pat. No. 3,788,018. This application July 19, 1973, Ser. No. 380,741
Int. Cl. E04f *11/02*
U.S. Cl. 52—741 **3 Claims**

1. The method for installation of the multi-story prefabricated stair unit comprising opposite runs of at least one pair of laterally spaced apart flights of stairs with the upper end of one flight and the lower end of the other flight alongside one another at about midway between the height spanned by the flight, headers formed at the ends of each flight of stairs and dimensioned to have a length greater than the width of the laterally offset pairs of stair flights to provide a portion extending laterally beyond the stairs for anchorage into walls, newels extending vertically between the laterally offset flights of stairs and joined thereto to provide a central internal support for the assembled flights of stairs, means for mounting a platform to extend horizontally outwardly from the upper end of the one flight and the lower end of the other flight at a level with said ends midway between the height spanned by the flights in which the platform is pivotally mounted with respect to the meeting ends of the lower and upper flights of each pair for rocking movement between raised and normal horizontal position and which includes a cross brace member secured to



the underside of the platform to extend crosswise thereof beyond the pivot and having portions projecting laterally beyond the platform for anchorage into adjacent walls of the building, and temporary supports engaging the portions of the platform beyond the pivot when in horizontal position for temporary support of the platform in its pre-installed relation, the method comprising positioning the prefabricated multi-story stair unit to extend vertically from a supporting base, lowering the platform to horizontal position, engaging the platform when lowered to horizontal position with the temporary supports for support of the platform in horizontal position, anchoring the laterally extending portions of the support members in the adjacent walls of the stair well as they are formed and then removing the temporary supports for permanent installation of a multi-story stair unit in the building.

3,859,772
LOADING A CONTAINER WITH LAYERS OF BOTTLES
Michel J. L. Thierion, Muizon, 51140 Jonchery-sur-Vesle, France
Filed Feb. 15, 1974, Ser. No. 443,040
Claims priority, application France, Feb. 22, 1973, 73.06236
Int. Cl. B65b *21/06, 35/56*
U.S. Cl. 53—26 **12 Claims**

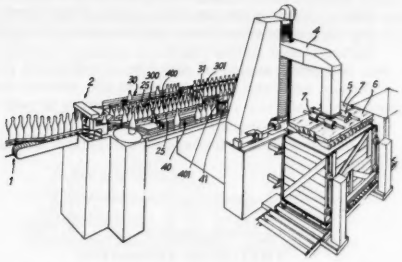
1. A process for automatically filling a container from a line of bottles on a conveyor including the steps of:

a. disposing the bottles in parallel rows grouped in pairs the number of which is determined by the number required for a layer of imbricated bottles in the container,

b. laying the bottles of each group of two rows facing one another at two different levels to obtain groups of recumbent bottles separated by a gap,

c. simultaneously seizing the recumbent bottles of all groups and moving them to the container while moving the groups towards one another to reduce said gap and obtain

a layer of bottles at two levels,
depositing the layer of bottles in the container, and

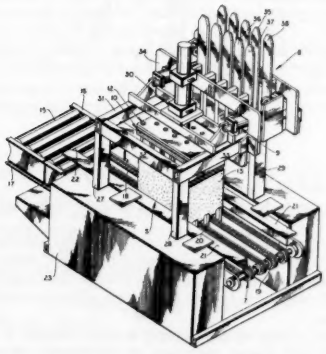


e. repeating steps (a) to (d) to obtain successive layers deposited one on the other in the container.

3,859,773
MEANS FOR APPLYING AN ARTICLE CARRIER TO A PLURALITY OF ARTICLES

Rodney K. Calvert, Dunwoody, and Alton J. Fishback, Austell, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Nov. 9, 1973, Ser. No. 414,032
Int. Cl. B65B *21/00*; **B65b** *27/04*
U.S. Cl. 53—48 **7 Claims**

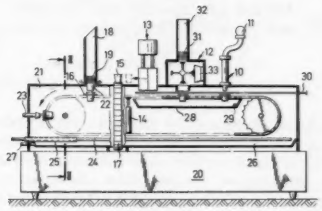


1. A machine for applying an article carrier having a plurality of apertures therein to a plurality of articles so that a part of each article is enveloped by one aperture, said machine comprising conveyor means for moving a group of articles arranged in side by side relationship into a loading station, a vertically reciprocable plunger disposed above said loading station, a carrier holder supported by said plunger by a lost motion relationship and movable between a carrier receiving position above the tops of the articles to a carrier applying position in proximity to the tops of the articles and having at least one carrier cavity therein for receiving a carrier and for holding said carrier in substantially fixed position relative to said holder, and article positioning means movable downwardly with said carrier holder and engageable with the upper portions of a group of articles to determine its lower limit of travel and so as to align the articles with the apertures in the carrier in coordination with downward movement of said plunger toward the group of articles, said plunger being engageable with the carrier and being effective to drive the carrier out of its cavity in said holder and to cause the apertures therein to envelope parts of the articles respectively following alignment of the articles with the apertures respectively.

3,859,774
APPARATUS FOR THE STERILE PACKAGING OF FOODSTUFFS

Franz Hubert Bausch, Wuppertal, Germany, assignor to Firma Hamba-Maschinenfabrik Hans A. Muller, Wuppertal-Vohwinkel, Germany

Filed Mar. 22, 1973, Ser. No. 343,800
Claims priority, application Germany, Mar. 23, 1972, 2214080
Int. Cl. B65b *55/10, 3/00*
U.S. Cl. 53—167 **9 Claims**



1. In an apparatus for the sterile packing of food and including a conveyor defining a transport path for containers to be filled, a magazine for depositing the containers in succession upon said conveyor, sterilizing means along said path for spraying the containers on said conveyor with a sterilizing liquid, drying means for drying the sprayed containers, filling means for introducing foodstuffs into said containers, lid-applying means for applying a lid to each of the filled containers to form packages, sealing means for sealing the lid to each package, and ejector means for removing said packages from the conveyor, the improvement wherein:

a. said conveyor is formed as an endless chain having an upper pass and a lower pass and is provided with at least one row of seats adapted to receive said containers;
b. said apparatus comprises housing means completely enclosing said conveyor chain and the entire length of the path of said containers thereon;
c. said filling means, said lid-applying means said sealing means, and said ejector means are provided along the upper pass of said conveyor chain;
d. said magazine opens directly into said chamber to deposit said containers on said chain at a location spaced along said path from said filling means such that the length of travel of said container from said magazine to said filling means is a distance greater than half the length of said chain;
e. said sterilizing means for spraying said liquid onto said containers comprises a spray nozzle trained on said containers carried by said conveyor at a location spaced from said filling means along said path such that the length of travel of said container from said sterilizing means to said filing means is a distance at least equal to half the length of said chain whereby said liquid has a path of action corresponding at least to said lower pass of the chain;
f. said drying means includes a pipeline extending along said lower pass of said chain and provided with nozzles for directing a drying gas onto said containers; and
g. said apparatus further comprises a partition disposed in said chamber between said pipeline and said filling, lid-applying and sealing means, said partition defining with said filling, lid-applying and sealing means a compartment pressurized with sterile gas.

3,859,775

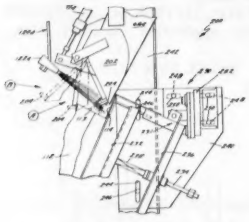
PRODUCT PACKAGING APPARATUS

Lee S. Kihnke, Spring Lake, Mich., assignor to Dake Corporation, Grand Haven, Mich.

Continuation-in-part of Ser. No. 254,074, May 17, 1972, Pat. No. 3,807,123. This application June 1, 1973, Ser. No. 365,972

Int. Cl. B65b *43/36*

U.S. Cl. 53—189 **13 Claims**



1. Packaging apparatus for the packaging of material comprising in combination: receptacle means for receiving material to be packaged; support means for supporting at least one bag for receiving said material from said receptacle means; said receptacle means having closure means adapted to open said bag, release said material into said bag, and remove said bag from said support means; and fluid means arranged to cooperate with said support means and said closure means for initially opening said bag; said closure means including means for positively grasping said bag as said bag is opened, said grasping means facilitating the retention of said bag in an open position while said material is released and facilitating the removal of said bag from said support means.

3,859,776

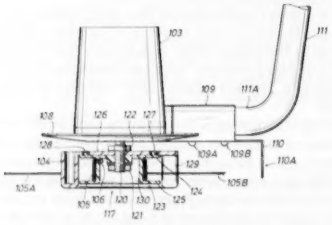
ROTARY CUTTING ASSEMBLY

George C. Ballas, and Thomas N. Geist, both of Houston, Tex., assignors to Weed Eaters, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 321,580, Jan. 8, 1973, , which is a continuation-in-part of Ser. No. 207,198, Dec. 13, 1971, Pat. No. 3,708,967. This application Apr. 5, 1973, Ser. No. 347,997The portion of the term of this patent subsequent to Jan. 9, 1990, has been disclaimed.

Int. Cl. A01d *55/18*

U.S. Cl. 56—12.7 **19 Claims**



13. As a subcombination,

a circular head member rotatable in a cutting plane and having spaced-apart curvilinear bearing surfaces arranged perpendicular to said cutting plane about the periphery of said head member, and

a flexible non-metallic line member having a coiled portion interconnected with and arranged concentrically in said head member and further having a free traveling end portion lying in said cutting plane and extending outwardly of the periphery of said head member from between said bearing surfaces,

said bearing surfaces each having a radius of curvature at least great enough to support a section of said free traveling end portion of said line member against angular deformation in said cutting plane,

said supported section of said free traveling end portion further normally abutting against the bearing surface leading said end portion during rotation of said head member and being normally spaced forwardly away from the bearing surface trailing said end portion during such rotation.

3,859,777

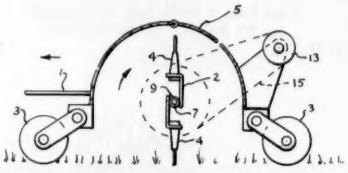
THATCHING APPARATUS

Charles W. Doering, Clarksville, Ind., assignor to Brinly-Hardey Co., Inc., Louisville, Ky.

Continuation-in-part of Ser. No. 306,353, Nov. 13, 1972, abandoned. This application May 29, 1973, Ser. No. 364,906

Int. Cl. A01d *77/00*

U.S. Cl. 56—16.7 **17 Claims**



1. A thatching apparatus including:

support means for rotation about a substantially horizontal axis;

said support means having blades supported thereon in a plurality of rows angularly spaced from each other about the axis of rotation, each of said rows of said blades being equally angularly spaced from each adjacent row of said blades;

said rows of said blades forming an even number of rows;

each of said blades including an elastomeric mounting member formed of a material capable of bending and returning to its original shape after bending;

means cooperating with said elastomeric mounting member to mount said blade on said support means;

each of said blades in each of said rows having at least one tine integral with said elastomeric mounting member for thatching action;

each tine in each of said rows being disposed in spaced relation to each other;

said elastomeric mounting means having a broad portion in comparison with the width of any of said tines integral therewith, said broad portion of said elastomeric mounting member extending beyond said support means;

said mounting means including means to insure that said elastomeric mounting member and any of said tines integral therewith return to their original positions after any bending;

said support means including a single support member;

and said mounting means including separate means to secure each pair of said rows of said blades that are disposed 180° from each other to said support member.

3,859,778

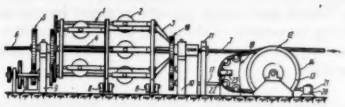
DEVICE FOR STRETCHING ROUND TWISTED PRODUCTS IN ROPE MAKING MACHINES

Pavel Petrovich Nesterov, ulitsa Sumskaya, 128, kv. 28, and Georgy Ivanovich Vlaschenko, Stadionny proezd, 6/1, kv. 49, both of Kharkov, U.S.S.R.

Filed Jan. 11, 1974, Ser. No. 432,652

Int. Cl. D07b 3/04, 3/06

U.S. Cl. 57—6 1 Claim



1. A device for stretching round twisted products, adapted to be used in rope machines and comprising: a first pulley adapted to draw out the twisted product just after its having been spun; means for imparting a torque to said first pulley; a second pulley adapted to stretch said twisted products and having a diameter somewhat larger than that of said first pulley; a friction clutch being disposed between said first and second pulleys and adapted to transmit the torque from said first pulley to said second pulley for stretching said twisted products; a self-contained drive kinematically associated with said friction clutch; and a device adapted to pass said twisted products from one of said first and second pulleys to the other, said device being spaced somewhat apart from said first and second pulleys; a stretching force transducer adapted to interact with a member of said device which is under maximum load imposed by the twisted product tightening force, and to produce a signal proportional to said force to control said self-contained drive, whereby the torque transmitted by way of said friction clutch from said first pulley having the smaller diameter to said second pulley having the larger diameter, can be changed in the course of the stretching process.

3,859,779

METHOD OF AND APPARATUS FOR OPEN-END SPINNING

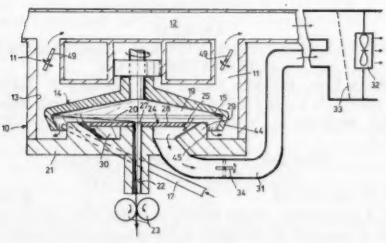
Joachim Furstenberg, Aichelberg, Germany, assignor to LTG Lufttechnische GmbH, Stuttgart, Germany

Filed Nov. 6, 1972, Ser. No. 303,714

Claims priority, application Germany, Nov. 5, 1971, 2155171

Int. Cl. D01h 1/12, 1/00

U.S. Cl. 57—58.89 10 Claims



1. In a method of open-end spinning of the type including the known steps of (a) feeding loose fibers into an annular fiber groove of a rotating portion of a spinning chamber, (b) depositing said loose fibers into a circular fiber groove provided in the wall of the rotating portion of the spinning chamber, (c) spinning a yarn from the fibers by virtue of the rotation of the spinning chamber, and (d) continuously withdrawing the spun yarn substantially coaxially with the rotary axis of the spinning chamber, any portion of said yarn describing simultaneously a motion from said fiber groove to said axis and a rotary, orbiting motion thereabout, the improvement comprising the step of generating an annular air drain spacedly surrounding the rotary axis by forming an annular opening in a stationary portion of the spinning chamber, the annular opening being so positioned that at any instant during the travel of the yarn in the spinning chamber a yarn length having a loose twist is within the zone of said air drain, and that the air flow in said air drain is at an angle to the travelling path of the yarn in the spinning chamber.

3,859,780

A METHOD OF FORMING AN ANCHOR CABLE

John Vincent Brown, Granborough, England, assignor to Fosroc A.G., Zug, Switzerland

Filed Nov. 12, 1973, Ser. No. 415,044

Claims priority, application Great Britain, Nov. 17, 1972, 53190/72

Int. Cl. D07b 7/14, 7/12, 1/16

U.S. Cl. 57—162 2 Claims

1. A method of making an anchor cable having a sheath and an end portion, with a plurality of wires extending into said end portion, comprising the steps of, locating the wires of said end portion in said sheath and thereafter introducing a mixture of an unsaturated polyester resin and a catalyst therefor into said sheath and about said wires, with said sheath acting as a mold, said mixture setting rapidly thereafter to bond the wires together.

3,859,781

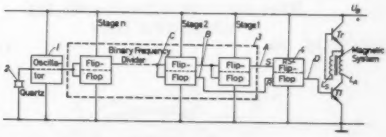
SYNCHRONIZATION SYSTEM FOR WATCHES

Wolfgang Sauer, Freiburg, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed July 23, 1973, Ser. No. 381,649

Int. Cl. G04b 3/02; H02k 33/10; H02p 7/24

U.S. Cl. 58—28 A 5 Claims



1. A system for synchronizing mechanical vibrators of clocks and watches comprising a rotatable balance wheel including a pair of spaced discs rotatable together on a common shaft, each disc having a respective magnet mounted thereon and aligned with the other said magnet, said wheel and magnet having a given rest position, electromagnetic driving means positioned adjacent said wheel and magnet, said wheel rotating backward and forward with respect to the position of said driving means and having a nominal frequency, said driving means including a driving coil and control coil positioned between said discs and magnets and having a common center angularly displaced from said rest position, switching means for applying driving pulses to said driving means, a crystal oscillator and frequency divider providing synchronizing pulses substantially equal in frequency to the nominal frequency of said balance wheel, and control means

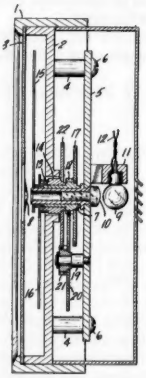
for applying said synchronizing pulses to said switching means during each forward and backward movement of said balance wheel, said switching means and driving means maintaining the frequency of said balance wheel.

3,859,782

CLOCK WITH ILLUMINATION DEVICE

Kiyoshi Kitai, Tokyo, Japan, assignor to Seiko Koki Kabushiki Kaisha

Filed May 7, 1974, Ser. No. 467,749
Claims priority, application Japan, May 9, 1973, 48-50646
Int. Cl. G04b *19/30*
U.S. Cl. 58—50 R **6 Claims**



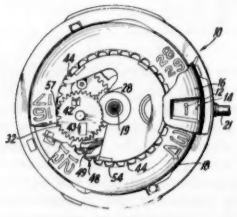
1. A clock comprising, a case, a dial mounted internally of said case and having time indicia on a face thereof, a light-transmitting open ended tube coaxial with said dial and extending therethrough, a light source disposed spaced from a backside of said dial transmitting light through said tube and forwardly of said dial, illumination means disposed spaced from the face of the dial, receiving the light transmitted through said tube and transmitting it on to the face of the dial.

3,859,783

DAY-DATE CALENDAR MECHANISM

Paul Wuthrich, Watertown, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Apr. 8, 1974, Ser. No. 458,914
Int. Cl. G04b *19/24*
U.S. Cl. 58—58 **11 Claims**



1. A day-date watch including drive means to rotate the hands of the watch comprising:

an hour wheel coupled to the watch drive means to make a complete rotation every 12 hours,

a day-date wheel coupled to the hour wheel and driven thereby to make a complete rotation every 24 hours, said wheel including an upwardly projecting day tab and an upwardly projecting date tab,

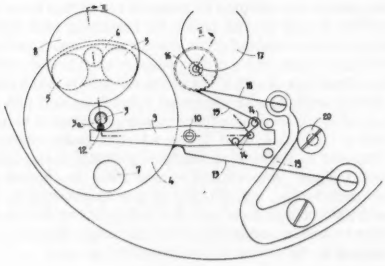
a day dial having indicia thereon and including a plurality of downwardly extending teeth positioned on the face thereof, one of said teeth being engaged by the day tab during each 24 hour period to rotate said day dial, and, a date dial having indicia thereon and including a plurality of internal teeth corresponding to the days of a month, said teeth extending downwardly and having rearwardly extending faces which are engaged by the date tab to be rotated in a forward direction during normal operation of the watch and which are not engaged by the date tab during movement of the tab in a reverse direction during a setting operation so that the date may be set relative to the day.

3,859,784

ELECTRIC WATCH WITH ELECTRODYNAMIC MOTOR

Ali Schneiter, Neuchatel, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed Dec. 10, 1973, Ser. No. 423,132
Int. Cl. G04c *3/04*
U.S. Cl. 58—28 D **3 Claims**



1. Electric watch with electrodynamic motor comprising a transductor which has a movable element and the coil of which is stationary and at least one magnet carried by the movable element, characterized by the fact that it comprises a driving mechanism by the intermediary of which the said movable element drives the elements indicating the time, this driving mechanism being situated at the level, measured in height, of the said coil and being made of non-magnetic and insulating material at least in its portion swept by the field of the movable magnet, for preventing perturbations due to magnetic causes and to currents of Foucault.

3,859,785

TURBINE ENGINE WITH INTEGRAL COMPRESSOR AND ALTERNATOR ROTOR

Anthony Leto, Franklin Lakes, N.J.; Richard F. Jaklitsch, Yonkers, N.Y., and Edward R. Ackerman, North Haledon, N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

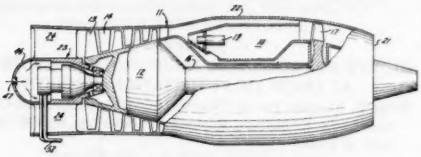
Filed Dec. 17, 1973, Ser. No. 425,262
Int. Cl. F02g *3/00*; **F02c** *7/12*
U.S. Cl. 60—39.33 **5 Claims**

1. A gas turbine engine having an outer shell, an air intake zone at one end of the shell, a compresor downstream from the air intake zone, a shaft driving the compressor, and a turbine rotor driving the shaft, all coaxially disposed within the shell, wherein the improvement comprises:

a. struts extending radially inwardly from the engine shell in the intake zone and supporting a generally cylindrical hollow member coaxial with the compressor shaft and upstream therefrom;

b. electrical generating means disposed within the cylindrical hollow member and having a stator portion and a

rotary portion, the rotary portion being integrally coupled to the compressor shaft and rotatable therewith;

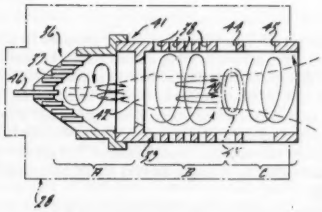


c. the downstream end of the cylindrical hollow member seating and positioning a bearing, and the forward end of the compressor shaft having a journal portion journaled in the bearing.

3,859,786
COMBUSTOR

Nicolas Alan Azelborn, Ypsilanti; Joseph Errante, Dearborn, and Antoni Paluszny, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 25, 1972, Ser. No. 256,883
Int. Cl. F02c *7/22*; **F23d** *11/44*; **F23c** *5/18*
U.S. Cl. 60—39.65 **1 Claim**



1. A chamber assembly for use in a continuous combustion process effective to provide low NO_x emissions, comprising:

a mixing chamber having an inlet, an outlet and means interposed between said inlet and outlet for directing a non-laminar controlled turbulent flow of compressed air therethrough,

fuel supply means for continuously adding fuel to said flow in said mixing chamber at a location adjacent to said inlet and at a rate to provide for a substantially homogeneous gaseous air/fuel mixture passing through said outlet,

a combustor chamber in communication with the outlet of said mixing chamber for continuously passing said air/fuel mixture therethrough and having a path for said mixture which is significantly longer than the path of said mixture through said mixing chamber,

ignition means effective to ignite said mixture for sustained flaming combustion in said combustor chamber,

means for tangentially introducing a flow of compressed air into said combustion chamber for inducing vortical flow therein,

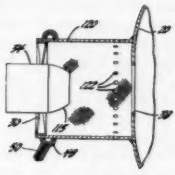
said induced vortical flow being effective to define an aerodynamic orifice for effecting accelerated release of combustion products from said combustor chamber, and

means for introducing a vortical flow of quenching medium into said exhaust gases from said combustor chamber.

3,859,787
COMBUSTION APPARATUS

Robert D. Anderson, Indianapolis, and Dennis L. Troth, Speedway, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 4, 1974, Ser. No. 439,648
Int. Cl. F02c *7/22*
U.S. Cl. 60—39.71 **3 Claims**

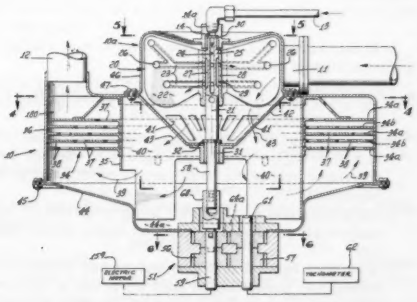


1. A combustion apparatus adapted for use in a gas turbine engine characterized by substantially complete combustion of liquid hydrocarbon fuel and by a low output of nitrogen oxides, the apparatus comprising a combustion liner having a discharge outlet for combustion products at the downstream end of the liner; the liner having an upstream end and liner wall means extending from the upstream end to the downstream end, the wall means enclosing, in sequence from the upstream end to the downstream end, a prechamber, a reaction zone, and a dilution zone; the prechamber including air entrance means at its upstream end effective to direct combustion air with substantial velocity downstream over the inner surface of the prechamber wall means, and liquid fuel introduction means downstream of the said air entrance means disposed to lay a film of liquid fuel on the said inner surface for evaporation by and mixture in the prechamber with the said combustion air, wherein the improvement comprises a textured configuration of the said prechamber wall means inner surface defined by a grid of two sets of intersecting grooves in the surface and bosses rising between adjacent grooves, adapted to allow flow of the liquid fuel through the grooves and evaporation of the fuel from within the grooves by the flow of air over the said surface.

3,859,788
COMBUSTION GAS TREATMENT

Orville D. King, 22800 Runnymeade St., Canoga Park, Calif. 91304, and Joseph G. Rosales, 13513 S. Arcturus Ave., Gardena, Calif. 90249

Filed June 11, 1973, Ser. No. 368,721
Int. Cl. F01n *5/04*
U.S. Cl. 60—280 **13 Claims**



1. Combustion gas treatment apparatus comprising

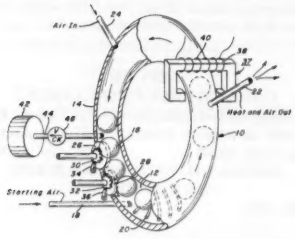
a. a chamber having a combustion gas inlet and a processed gas outlet, the inlet gas containing pollutant,
b. first means to supply to the chamber treatment liquid including an aqueous solution of mineral salts,
c. other means communicating with said supply means to deliver the liquid in dispersed form into the gas flowing within the chamber and to effect intimate contacting of the delivered liquid with combustion gas in response to said gas flow through the chamber, for enhancing absorption of gas entrained pollutants by particles of the dispersed liquid, said other means including rotary impeller structure rotatable in the path of combustion gas and liquid passage through the chamber to effect intimate mixing of the liquid and exhaust gas, said impeller structure containing flow channels to receive and initially disperse the liquid into the flowing combustion gas in the chamber as the impeller rotates,
d. and collector means to collect treating liquid and absorbed pollutant separating from the gas within the chamber, said collector means including a series of deflegmator baffles in the path of the combustion gas dispersed liquid flow between the impeller and said outlet, said baffles containing staggered perforations to pass the flow and also presenting surfaces to collect and separate particels of treating liquid and pollutant from the flow, the chamber containing an open flow path which changes direction between the impeller structure and the baffles and from which liquid may gravitate away from the baffles.

3,859,789

METHOD AND APPARATUS FOR CONVERTING ONE FORM OF ENERGY INTO ANOTHER FORM OF ENERGY

Sherwood L. Fawcett, Columbus, and James N. Anno, Cincinnati, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 222,220, Jan. 31, 1972, abandoned. This application Jan. 15, 1973, Ser. No. 323,770
Int. Cl. F15b *21/00*
U.S. Cl. 60—325 **26 Claims**



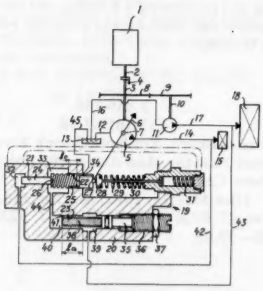
1. In the method for converting a first form of energy into a second form of energy, the steps of:
a. providing a closed, continuous loop passageway containing a plurality of freely movable, mechanically unrestrained bodies;
b. generating a force between successive ones of said bodies in a first region of said passageway to thereby propel successive ones of the bodies in one direction around the passageway;
c. permitting said bodies, after being propelled, to essentially freely accelerate in a second region of the passageway;
d. at a pont beyond said first and second regions in the passageway converting at least a portion of the kinetic energy of the propelled bodies into another form of energy while the bodies are decelerated as the kinetic energy is converted into another form of energy; and
e. then returning successive ones of said bodies through a third region back to said first region where they are again propelled in said one direction by generation of a force therebetween, the bodies being further decelerated in said third region by compression of a gas.

3,859,790

DEVICE FOR SUPPLYING FLUID UNDER PRESSURE TO AT LEAST TWO UTILISATION CIRCUITS

Serge B. Bacquie, rue de Picardie, 60610 Lacroix-Saint-Ouen, and Louis E. Martin, Residence Brichebay, 60300 Senlis, both of France

Filed Sept. 13, 1973, Ser. No. 396,768
Int. Cl. F16h *39/46*
U.S. Cl. 60—422 **11 Claims**

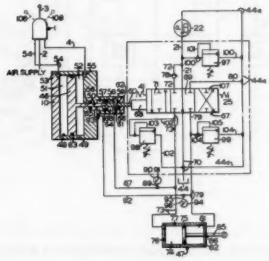


1. A device for supplying fluid under pressure to at least two utilization circuits, each being connected to be supplied by a group of pumps comprising at least one pump and one delivery pipe, one of said groups of pumps being of the constant-delivery type, at least one other of said groups of pumps being of the variable-delivery type and having a member for controlling delivery thereof, the input shafts of the groups of pumps being connected to a single driving shaft, said supply device including:
a. at least one power regulator comprising a first jack having a piston;
b. means for rigidly connecting the cylinder of said first jack to the body of the pumps of said other groups;
c. means for coupling the piston of said first jack to said member for controlling the delivery of said other group;
d. a resilient member, said piston being subjected to the opposing actions of said resilient member and of the pressure of fluid in said delivery pipe of said other group of pumps;
e. a second jack having a piston;
f. means for rigidly connecting the cylinder of said second jack to the body of said pumps of said other group;
g. means for connecting the piston of said second jack to said member controlling the delivery of said other group, said piston delimiting with said cylinder of said second jack a chamber, said piston of said second jack being subject to the opposing actions of said resilient member and the pressure of fluid in said chamber;
h. a connecting pipe, said chamber being connected to said delivery pipe of said one group of pumps by said connecting pipe;
i. a first laminar hydraulic restriction disposed in said connecting pipe; and
j. a second restriction, having a hydraulic resistance which is variable in dependence on the position of said piston of said second jack in its said cylinder, which connects said chamber with an enclosure at substantially zero pressure.

3,859,791
FLUID OPERATED HYDRAULICALLY LAPPED CONTROL APPARATUS

Clifford W. Allen, and Paul E. Olson, both of Lexington, Ky., assignors to American-Standard Inc., New York, N.Y.

Filed July 9, 1973, Ser. No. 377,330
Int. Cl. F15b *15/18*
U.S. Cl. 60—477 **3 Claims**



1. In a controlling apparatus for fluid pressure equipment, the combination of:

a. a constant output hydraulic pump for supplying hydraulic fluid under pressure, wherein the improvement comprises:

b. a one-way flow valve means,

c. a double-acting hydraulic fluid motor provided with a piston having on each side thereof a chamber to which hydraulic fluid under pressure may be supplied,

d. a sump,

a three-position valve means having a first hydraulic supply port to which said pump supplies hydraulic fluid under pressure via said one-way flow means, a second supply port to which said pump simultaneously supplies hydraulic fluid under pressure in bypassing relation to said one-way flow means, a pair of hydraulic delivery ports to enable said valve means to respectively in one and another of its positions effect the supply of hydraulic fluid under pressure from said pump to the respective chamber at each side of said piston of said fluid motor, and a pair of release ports connected to said sump, one of which in said one and another positions selectively connects the respective chamber at one side of said piston of said fluid motor to said sump to release hydraulic fluid under pressure from one of said chambers to said sump simultaneously as hydraulic fluid under pressure is supplied to the other of said chambers from said pump via one of said delivery ports, and the other of which release ports, in the third one of said positions, establishes a communication through which hydraulic fluid under pressure supplied by said pump to said second supply port is released to said sump to enable operation of said hydraulic pump under minimum load while said valve means occupies said third one of said positions,

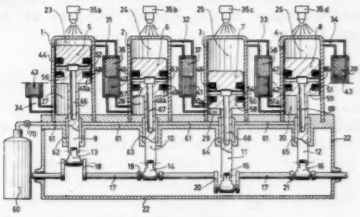
f. differential-type abutment means having two abutments the area of the respective sides of one of which is less than the area of the respective sides of the other, and said abutment means being rigidly connected to said valve means for controlling the operation thereof to establish said communications, the respective sides of said one abutment being constantly connected to said delivery ports and selectively subject to the pressure in one of said delivery ports or in one of said release ports, and

g. means for effecting variations of a pneumatic or hydraulic fluid pressure force on the respective opposite sides of the other of said two abutments to cause the operation of said valve means from said third position respectively to said one and another position so long as said pneumatic or hydraulic fluid pressure force on one of said respective opposite sides of said other abutment exceeds the hydraulic fluid pressure force on that side of said smaller abutment opposite said one side of said other abutment, and the operation of said valve means from either said one or said another position to said third position upon the reduction of the pneumatic or hydraulic fluid pressure force acting in one direction on said larger abutment to a value less than the hydraulic fluid pressure force acting in an opposite direction on said smaller abutment.

3,859,792
HOT-GAS RECIPROCATING APPARATUS WITH POWER CONTROL DEVICE

Frits Reinink, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 29, 1974, Ser. No. 465,312
Claims priority, application Netherlands, May 15, 1973, 736711
Int. Cl. F02g *1/06*
U.S. Cl. 60—521 **3 Claims**



1. A hot-gas reciprocating apparatus provided with at least one cylinder in which a piston connected via a piston rod to a driving means is reciprocable, at least one end face of this piston influencing the volume of a working or compression space, while between the cooperating walls of the piston and the cylinder at least two axially spaced sealing elements are provided which are accommodated in grooves formed in the said piston wall or cylinder wall and bound between them an intermediate space which separates the working space from an expansion space, the apparatus having in combination therewith the improvement of a device for controlling the amount by weight of working fluid in the working space, which device comprises a storage container for working fluid which can be caused to communicate with the working space via a duct, the duct formed in the piston rod extends with its end remote from the storage container opening into the intermediate space, and the sealing element which separates the intermediate space from the working space together with the associated groove is constructed as a non-return valve which allows workingfluid flow in one direction only from the intermediate space to the working space.

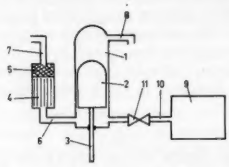
3,859,793
METHOD FOR REGULATING THE POWER OUTPUT OF A HOT GAS ENGINE

Lennart Ingemar Jansson, Karrsangarvagen, Sweden, assignor to Kommanditbolaget United Stirling (Sweden) AB & Co., Malmo, Sweden

Filed Aug. 22, 1973, Ser. No. 390,622
Claims priority, application Great Britain, Aug. 22, 1972, 38970/72
Int. Cl. F02g *1/06*
U.S. Cl. 60—521 **3 Claims**

1. A valve connected for controlling the dead volume of the low temperature working gas space in a hot gas engine to regulate the power output comprising in combination, a dead volume chamber connected to said low temperature working gas space by valve structure for controlling flow of gas be-

tween said chamber and said space, and means operating said valve structure for varying the flow of gas through said valve



in a flow pattern passing from an initial maximum gas flow condition through a gradual decrease of gas flow.

3,859,794

DEVICE FOR GOVERNING THE TEMPERATURE OF A HEATER HEAD OF A HOT GAS ENGINE

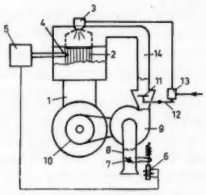
Sven Anders Samuel Hakansson, Malmo, Sweden, assignor to Kommanditbolaget United Stirling (Sweden) AB & Co., Malmo, Sweden

Filed May 3, 1973, Ser. No. 356,775

Claims priority, application Great Britain, May 5, 1972, 20986/72

Int. Cl. F23k *5/00;* **F02g** *1/06*

U.S. Cl. 60—524 **4 Claims**



1. A device for governing the temperature of a heater head of a hot gas engine having a combustion chamber comprising in combination a temperature-responsive element giving signals in accordance with the temperature of the heater head, a servo-system governed by said signals, regulating means including a combustion air blower governing the rate of delivery of combustion air from said blower operable by said servo-system, and means responsive to the rate of flow of combustion air from the blower including a fuel-control valve for regulating the flow of fuel for combustion with the air delivered by said blower, wherein said means responsive to the rate of flow of combustion air comprises a vane movably arranged in said flow to offer constant resistance against said air flow and to move in the direction of said air flow in proportion to the rate of flow and wherein the fuel control valve being of such known type that the rate of fuel delivery is a direct function of the displacement of a part of the fuel-control valve with a lever transmitting movements to this part from the said vane.

3,859,795

LOAD CONTROL FOR CLOSED CYCLE GAS TURBINE

Hansulrich Frutschi, Riniken, Switzerland, assignor to Brown Boveri-Sulzer Turbomaschinen Aktiengesellschaft, Zurich, Switzerland

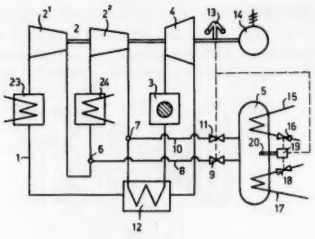
Filed Oct. 1, 1973, Ser. No. 402,068

Claims priority, application Switzerland, Oct. 4, 1972, 014465/72

Int. Cl. F01k *13/02, 3/00*

U.S. Cl. 60—652 **7 Claims**

1. A closed cycle gas turbine plant including an endless flow path which leads working medium in series through a compressor, or heater and a turbine; a storage vessel for a part of the working medium; and means for selectively connecting the storage vessel to two points in said flow path which are under



different pressures; and characterized in that at least the lower pressure one of said points to which the selecting means connects the storage vessel is situated between two stages of the compressor.

3,859,796

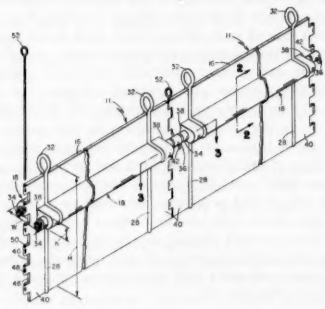
SUBMERSIBLE OIL BOOM

Robert A. Benson, Cohasset, Mass., assignor to Submarine Engineering Associates, Inc., Cohasset, Mass.

Continuation-in-part of Ser. No. 222,867, Feb. 2, 1972, Pat. No. 3,818,708. This application Mar. 27, 1974, Ser. No. 455,198

Int. Cl. E02b *15/04*

U.S. Cl. 61—1 F **16 Claims**



1. a submersible barrier section comprising

a vertical dam of solid rubberlike material resiliently deformable in all directions,

selectively flotatable and sinkable elements extending laterally from opposite sides of said dam below the top thereof each said element having

an outer shell of rubberlike material

resiliently expandable and compressible gas-filled flotation means within said outer shell to float said barrier section when expanded

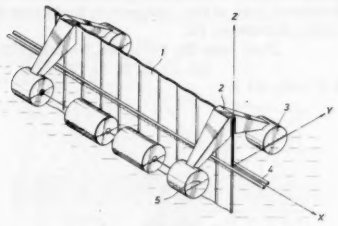
said outer shell being chargeable with water under pressure to compress said gas filled flotation means to sink said barrier section.

3,859,797

OIL BOOM

Ray R. Ayers, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 95,649, Dec. 7, 1970, abandoned. This application Sept. 26, 1972, Ser. No. 292,388
Int. Cl. E02b 15/04
U.S. Cl. 61—1 F 2 Claims



1. A boom for deployment on a water surface comprising: an upright skirt corrugated with the axes of corrugations running from top to bottom of the skirt;

support means for the skirt comprising at least one pair of V-shaped outriggers having floats attached to its extremities and inverted over the upper edge of the skirt and attached thereto;

tandem cables for carrying boom tension attached near the water line on opposite sides of the skirt; and

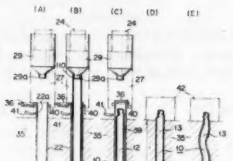
baffles spaced in front of the skirt.

3,859,798

METHOD OF CONSTRUCTING A FLEXIBLE SAND DRAIN

Osamu Terashima, Tokyo, and Ikuo Okabayashi, Yamato, both of Japan, assignors to Chiyoda Chemical Engineering & Construction Co. Ltd., Yokohama-shi, Japan

Filed July 23, 1973, Ser. No. 381,587
Claims priority, application Japan, May 22, 1973, 48-56378
Int. Cl. E02b 11/00; E02d 5/40
U.S. Cl. 61—11 3 Claims



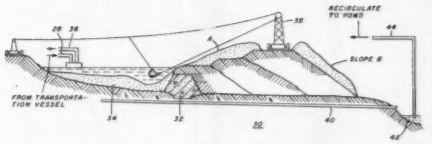
1. A method for constructing flexible sand drains in soft ground which includes the steps of: arranging in a regular polygonal form a plurality of casings having a sufficient large inner diameter to receive protectors comprising monofilament woven fabric having sufficiently large meshes to permit the passage of part of the sand filled in said protector, and provided at the top with a freely operable sealing cover; driving said casings into said soft ground at the same time by a vibro-hammer mounted on a pile driver; connecting the upper ends of said protectors to the outlets of a hopper mounted on said pile driver after said protectors are inserted into said casings and filling sand in said protectors by the vibration of said vibro-hammer to form sand pillars; introducing compressed air into said casings with the respective sealing covers closed; pulling said casings alone out of said soft ground while being vibrated by said vibro-hammer with the lubricating action of the sand passing through a gap between said casings and protectors, thereby firmly setting in said soft ground sand drains comprising said protectors and sand pillars contained therein.

3,859,799

LANDFILL DISPOSAL OF POWER PLANT WASTES

Charles M. Jaco, Jr., Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Jan. 23, 1973, Ser. No. 326,025
Int. Cl. C02c 3/00, 1/40
U.S. Cl. 61—35 4 Claims



1. Method of operating a landfill for dewatering and stabilizing finely divided solids-containing sludges transported thereto, said solids comprising fly ash and calcium-sulfur containing compositions, which solids are the waste products from a combination system utilizing sulfur containing fuel, wherein the landfill cor prises an initial holding basin, a secondary dewatering and stabilizing zone, and a stabilized landfill zone, which method comprises

a. admixing a predetermined amount of finely divided cementitious material with the sludge;

b. depositing the admixed solids containing sludge in the initial holding basin;

c. retaining the admixed sludge in said holding basin for a predetermined time to settle and partially stabilize the solids;

d. removing the settled and partially stabilized solids from the holding basin and depositing same in the secondary gravity dewatering and stabilizing zone and retaining same thereat to substantially complete the dewatering and stabilizing;

e. removing the substantially stabilized solids therefrom and depositing the solids in the stabilized landfill zone.

3,859,800

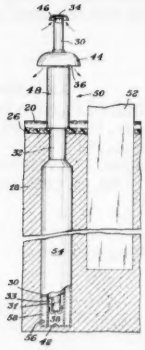
AIR CONVECTION DEVICE 2 A.G. FOR PERMAFROST STABILIZATION

Louis E. Wuelpern, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 15, 1973, Ser. No. 341,787
Int. Cl. E02d 3/00; F28 7/00
U.S. Cl. 61—36 A 7 Claims

1. A device for stabilizing permafrost adjacent thereto, said device located in the permafrost to a significant depth and having a longitudinal chamber, the outer wall portion of said chamber being of a substantially thermal conducting material, said device including inner and outer passageways extending longitudinally within said chamber, both of said passageways being open to the atmosphere at their uppermost extents, said passageways being in open communication with one another adjacent their lowermost extents, a thermocell having itself a chamber containing a liquid of a freezing temperature below that of said permafrost, said thermocell located at least partially about or adjacent said outer wall and penetrating into said permafrost, whereby air at a temperature less than that of the adjacent permafrost can enter the inner passageway and pass therefrom into the outer passageway adjacent the ther-

mocell located in said permafrost so as to act as a direct heat exchange media to remove heat from said thermocell which in



turn absorbs heat from the permafrost to thereby stabilize the permafrost.

3,859,801

DEVICES FOR EFFECTING AUTOMATIC WATER SPRAYING IN MINERAL MINES

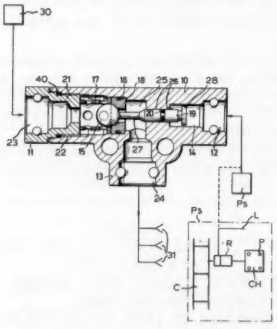
Walter Weirich, Dortmund, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Westfalia, Germany

Filed Jan. 28, 1974, Ser. No. 437,093

Claims priority, application Germany, Feb. 3, 1973, 2305361

Int. Cl. E21d *23/00*

U.S. Cl. 61—45 D **6 Claims**



1. In or for a mineral mining installation employing roof-support chocks with hydraulically-operated telescopic props, ram for shifting the chocks and a hydraulic control system for operating the rams and the props;

means for effecting automatic spraying of water to suppress dust, said means comprising:

a source of water under pressure, a plurality of spray nozzles, a device having a body, an inlet to the body connected to the source of water, an outlet from the body connected to the spray nozzles, a valve in the body with a closure element engageable on a seating under the pressure of the water to close communication between the inlet and the outlet, means in the body for displacing the closure element away from the seating to open communication between the inlet and the outlet and a control chamber, in the body, for receiving pressure fluid which causes actuation of the displacing means, the control chamber being connected to the hydraulic system to receive pressure fluid when prop retraction or chock shifting occurs.

3,859,802

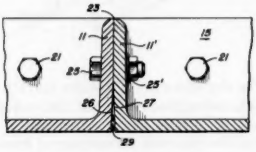
GASKETED WATERTIGHT SEGMENTED TUNNEL LININGS

James B. Platner, Severna Park, and Charles M. Schaefer, III, Baltimore, both of Md., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed June 20, 1973, Ser. No. 371,915

Int. Cl. E21d *11/14*

U.S. Cl. 61—45 R **4 Claims**



1. In a circumferential joint for connecting adjacent arcuate metallic segments of a tunnel lining subject to jacking forces, said segments including inwardly extending flanges having opposed plane surfaces jointed together by bolts, the improvement comprising:

a. a gasket positioned between and in contact with said plane surfaces of said flanges and extending only over a portion of said surfaces adjacent the outer end of said flanges for sealing; and

b. metal-to-metal contact between said plane surfaces of said flanges in the area of said bolts, for improved joint stiffness and resistance to creep of said gasket during jacking and bolting.

3,859,803

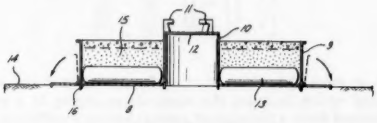
ANTI-SCOUR MEANS FOR SUBMARINE STRUCTURES

Kristen I. Pedersen, Scarsdale, and William F. Cavanaugh, Rockville Center, both of N.Y., assignors to Sofec Inc., Houston, Tex.

Filed Dec. 17, 1973, Ser. No. 425,229

Int. Cl. E02d *29/00*

U.S. Cl. 61—46 **10 Claims**

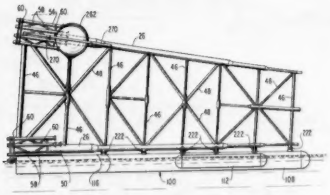


1. The combination with a structure projecting upwardly from a sea or stream bed of skirt means encompassing said structure and pivotally attached thereto, said skirt means being circumferentially yieldable to facilitate pivoting thereof between a compact position extending along the structure and an extended position for resting on the bottom material surrounding the structure to shield the same from scouring action of the water.

3,859,804
METHOD AND APPARATUS FOR TRANSPORTING AND LAUNCHING AN OFFSHORE TOWER

Albert M. Koehler; Jesse W. Crout, and Larry K. Shaw, all of Houston, Tex., assignors to Brown & Root, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 336,276, Feb. 27, 1973,. This application Apr. 25, 1973, Ser. No. 354,470
Int. Cl. E02b *17/00;* **B63c** *13/00*
U.S. Cl. 61—46.5 **27 Claims**



1. An offshore tower transport and launch apparatus comprising:

a first tubular buoyancy member including,

a unitary tubular section, and

a bifurcated tubular section connected to said unitary section at one end thereof;

means for connecting said first tubular buoyancy member to at least one leg of the offshore tower;

a second tubular buoyancy member including,

a unitary tubular section, and

a bifurcated tubular section connected to said unitary section at one end thereof;

means for connecting said second tubular buoyancy member to at least another leg of the offshore tower;

means transversely interconnecting said first and second tubular buoyancy members at spaced intervals along the length of said first and second tubular buoyancy sections;

first auxiliary tubular buoyancy means connected to the outboard side of said unitary tubular section of said first tubular buoyancy member for augmenting the buoyancy and stability of the transport and launch apparatus;

second auxiliary tubular buoyancy means connected to the outboard side of said unitary tubular section of said second tubular buoyancy member for augmenting the buoyancy and stability of the transport and launch apparatus;

means connected to at least said first and second tubular buoyancy members for operably controlling the buoyancy thereof, whereby an offshore tower may be transported to a marine site in a generally horizontal posture substantially above the surface of a body of water and launched at the preselected marine site into a generally vertical posture onto the bed of the body of water;

a first spherical buoyancy chamber connected to a base portion of another leg of the offshore tower in a posture substantially diametrically opposed to the bifurcated tubular section of said second tubular buoyancy member and generally above the bifurcated tubular section of said first tubular buoyancy member when the first and second tubular buoyancy members are in a horizontal posture;

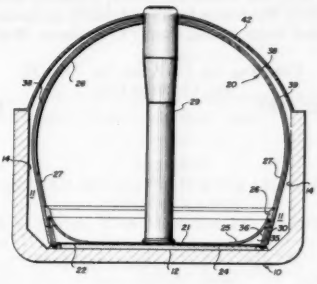
a second spherical buoyancy chamber connected to a base portion of at least another leg of the offshore tower in a posture substantially diametrically opposed to the bifurcated tubular section of said first tubular buoyancy member and generally above the bifurcated tubular section of said second tubular buoyancy member when the first and second tubular buoyancy members are in a horizontal posture; and

means connected to each of said first and second spherical buoyancy chambers to control the buoyancy thereof.

3,859,805
FLAT BOTTOM SHIP TANK FOR TRANSPORT OF LIQUEFIED GAS

Paul Richard Johnson, Oak Lawn; Jamshid Teymourian; Elmer Weyman Rothrock; Willis James Kircik, all of Hinsdale, and Kenneth Wilson Lange, Burr Ridge, all of Ill., assignors to Chicago Bridge and Iron Company, Oak Brook, Ill.

Filed Feb. 8, 1974, Ser. No. 440,785
Int. Cl. F17c *7/02*
U.S. Cl. 62—45 **8 Claims**



1. In combination:

a ship having a hold with a bottom and walls;

a tank, which is circular in horizontal section, for transporting a liquefied gas;

said tank comprising a metal shell having (1) **a substantially flat metal bottom** (2) a spheroidal section constituting most of the upper part of the tank and (3) a toroidal knuckle portion tangentially joined to the periphry of the metal button and tangentially joined to the spheroidal section;

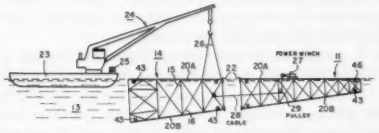
load bearing insulation between the ship hold bottom and the tank metal bottom; and

a skirt, circular in hoirzontal section, extending from the tank downwardly to a supporting base in the ship hold.

3,859,806
OFFSHORE PLATFORM

Arthur L. Guy, Houston, Tex., and John B. Reber, Jr., Sabah, Malaysia, assignors to Exxon Production Research Company, Houston, Tex.

Continuation-in-part of Ser. No. 286,374, Sept. 5, 1972, abandoned. This application Oct. 1, 1973, Ser. No. 402,661
Int. Cl. E02d *21/00;* **B63b** *35/40*
U.S. Cl. 61—46.5 **14 Claims**



1. A method of unitizing an offshore jacket for an offshore platform in water comprising:

fabricating an offshore jacket having at least three legs and at least two sections;

launching said sections into said water such that each is separately floating, each section having sufficient buoyancy to maintain at least one leg at the water's surface, the remaining leg or legs being submerged;

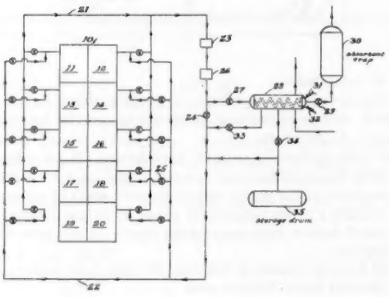
aligning the companion legs of said sections and drawing said sections together while floating said sections in said water;

guiding said surface legs on said sections into alignment prior to guiding said submerged legs on said sections into alignment to ensure proper alignment of said submerged legs.

3,859,807
COLD TRAP SYSTEM FOR RECOVERING CONDENSABLE GAS FROM A VESSEL TO BE EVACUATED

Manson Benedict, Westfield; William I. Thompson, Elizabeth, both of N.J., and Robert L. Parrish, Winthrop Harbor, Ill., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Aug. 26, 1947, Ser. No. 770,632
Int. Cl. B01d *5/00*
U.S. Cl. 62—55.5 **5 Claims**



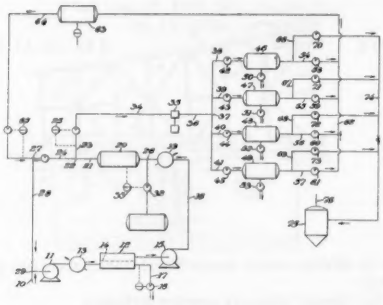
1. A system for recovering a condensible gas by solidifying the same in a cold trap that comprises a vessel to be evacuated, a pump having an inlet and an outlet side and arranged to withdraw gas from said vessel, means connecting said vessel with the intake side of said pump, a refrigerated cold trap for solidifying said gas, said trap having an inlet and an outlet, means connecting the inlet of said cold trap with the outlet side of said pump, an absorbent trap connected with the outlet of said cold trap and arranged to absorb traces of the condensible gas passing through said cold trap, and means for admitting an inert and relatively incondensible gas into said vessel to purge the condensible gas therefrom.

5. A system for recovering uranium hexafluoride gas by solidifying the same in a cold trap that comprises a diffusion cell to be evacuated, a vacuum pump having an inlet and an outlet side and arranged to withdraw said gas from said cell, means connecting said cell with the inlet side of said pump, a refrigerated cold trap for solidifying said gas, said trap having an inlet and an outlet, heating means associated with said cold trap whereby the contents of said trap may be converted to a fluid state, means connecting the inlet of said cold trap with the outlet side of said pump, said means including a filter arranged to remove traces of pump oil from the gas being withdrawn from the cell, a fluorocarbon trap connected with the outlet of said cold trap and arranged to absorb traces of uranium hexafluoride gas passing through the cold trap, means for admitting dry nitrogen gas to said cell to purge the uranium hexafluoride gas therefrom, and means for returning the uranium hexafluoride gas to said cell from said cold trap.

3,859,808
COLD TRAP FOR PURGING AIR FROM A GAS DIFFUSION SYSTEM

Manson Benedict, Westfield, N.J., assignor to The United States of America as represented by the Director of Scientific Research and Development Office for Emergency Mangagment, Washington, D.C.

Filed Apr. 5, 1946, Ser. No. 659,716
Int. Cl. B01d *5/00*
U.S. Cl. 62—55.5 **3 Claims**

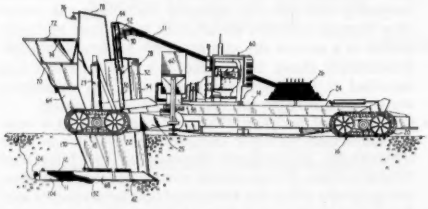


3. Apparatus for the separation of a gas mixture comprised of a condensable constituent and a non-condensable constituent that comprises a trap chamber, a first source of said gaseous mixture, an auxiliary source of said non-condensable constituent, a conduit for delivering said gaseous mixture from said first source to said trap chamber and means responsive to the mol percentage of the non-condensable constituent at a point in said conduit for adding non-condensable constituent from said auxiliary source to said conduit to maintain the mol percentate of said non-condensable constituent at a constant value.

3,859,809
PIPE BURYING RIPPER AND METHOD

Archie J. Clayhold, 1617 Virginia St.; Walter F. Hanson, 2326 Linden St., both of Dos Palos, and Louis F. Wells, 6110 Columbia Rd., Firebaugh, all of Calif.

Filed Feb. 13, 1973, Ser. No. 331,747
Int. Cl. E02f *5/10*; **E02b** *11/00*
U.S. Cl. 61—72.5 **10 Claims**



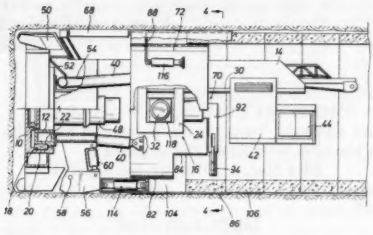
1. Apparatus for laying a flexible, drainage pipe comprising: a support; means mounting the support for movement over the ground; means carried by the support for ripping the soil to a predetermined depth as the support is moved over the ground, said ripping means having tubular structure for receiving the pipe and for feeding the same rearwardly into the ground at said predetermined depth as the ripper means moves forwardly through the ground; means adjacent to said ripping means for directing a mass of gravel to said structure; power actuated means within said structure for distributing the gravel in a substantially uniform layer about the pipe after the

latter has been received in said structure; and power means coupled with said distributing means and carried by said ripping means adjacent to the ripper and thereof for actuating said distributing means.

3,859,810
TUNNEL BORING MACHINE

Douglas F. Winberg, Issaquah, Wash., and Norman D. Dyer, Beaumont, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed May 23, 1973, Ser. No. 363,057
Int. Cl. E21d *9/00, 11/08*
U.S. Cl. 61—84 **24 Claims**



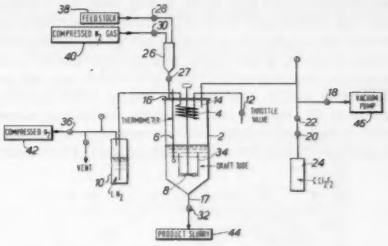
1. A tunnel boring machine comprising:
a cutterhead support assembly;
a cutterhead assembly rotatably mounted on said cutterhead support assembly;
a main frame connected to said cutterhead support assembly and extending in a generally rearward axial direction therefrom opposite said cutterhead assembly;
a gripper assembly slidably mounted on said main frame rearwardly of said cutterhead support assembly for axial movement relative to said main frame, said gripper assembly comprising a gripper carriage slidable on said main frame, a pair of grippers carried by said carriage and radially movable relative to the wall of a tunnel in which said machine is employed for engagement therewith, and means for selective radial projection and retraction of said grippers relative to said wall for engagement and non-engagement therewith;
an erector assembly connected to said gripper assembly and operative to construct a lining along the wall of said tunnel; and
drive means connected to said gripper assembly for driving said cutterhead support assembly forward relative to said gripper assembly when said grippers are engaged with the wall of said tunnel and thereby advancing said cutterhead assembly.

3,859,811
DEWAXING OF A HYDROCARBON FEEDSTOCK BY DIRECT CONTACT WITH A REFRIGERANT

Allan George Duncan, Harwell, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed May 30, 1972, Ser. No. 257,807
Int. Cl. B01d *9/04*
U.S. Cl. 62—58 **11 Claims**

1. A method of separating a component compound from a feed-stock by crystalliation of the component compound from the feed-stock, comprising the steps of
mixing the feed-stock with a refrigerant having a solubility of less than 10% by volume in the feed-stock and at such a temperature as to allow the refrigerant to evaporate from the mixture so as to cause cooling of the feed-stock, directing the evaporated refrigerant to a condenser to liquefy the refrigerant, liquefaction of the refrigerant gas being effected entirely by said condenser, and returning the condensed refrigerant by gravity to the feed-stock to

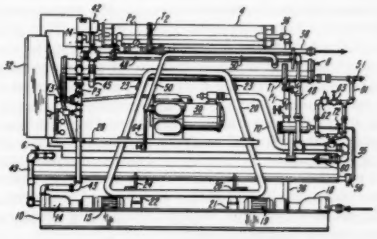


cause the feed-stock to cool to that temperature at which crystallization of the compound occurs.

3,859,812
METHODS AND APPARATUS FOR TREATING MACHINE TOOL COOLANTS

Richard B. Pavlak, 4361 Plantation Trl., Bellbrook, Ohio 43305

Filed Mar. 8, 1974, Ser. No. 449,382
Int. Cl. F25d *17/02*
U.S. Cl. 62—99 **8 Claims**



1. Apparatus for cooling a fluid coolant for a machine tool comprising a first heat exchange unit, means for circulating the fluid coolant between the machine tool and said first heat exchange unit, a second heat exchange unit, means for circulating a first heat transfer fluid between said first heat exchange unit and said second heat exchange unit, a third heat exchange unit, means for circulating a second heat transfer fluid between said second heat exchange unit and said third heat exchange unit, and means for circulating a third heat transfer fluid through said third heat exchange unit, the third heat transfer fluid being effective to cool the second heat transfer fluid in said third heat exchange unit, the second heat transfer fluid being effective to cool the first heat transfer fluid in said second heat transfer unit, and the first heat transfer fluid being effective to cool the fluid coolant in the first heat exchange unit.

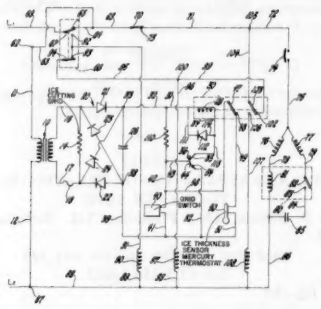
3,859,813
ICE MAKER CONTROL CIRCUIT

James A. Canter, Englewood, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 16, 1973, Ser. No. 416,681
Int. Cl. F25c *1/12*
U.S. Cl. 62—138 **3 Claims**

1. A solid state refrigeration control circuit for an automatic icemaker operative for sensing the presence of a finished slab of ice on a freezer plate and initiating an ice harvest cycle for the icemaker, means for refrigerating said plate to form an ice slab thereon, and means for defrosting the freezer plate and

causing the ice slab to slide onto an ice cube cutting grid, said control comprising, in combination; a mercury ice thickness control thermostat switch; a normally open grid switch being operable upon the slab of ice sliding from the freezing plate onto the cutting grid to close; a transistor having a base, an emitter and a collector; a rectifier circuit for producing rectification of an AC power input, said rectifier circuit having one terminal connected to both said grid switch and said mercury thermostat switch, said rectifier circuit other terminal connected to the base of said transistor via biasing means; normally closed first switch means connecting said transistor base to said mercury thermostat switch; second switch means having a normally closed contact energizing the plate refrigerating means and a normally open contact for providing an electrical path when closed for energizing the freezer plate defrosting means; said mercury thermostat switch being positioned a preselected distance above the plate such that when a predetermined thickness of the ice slab is achieved the temperature of the ice slab is sensed by said mercury thermostat switch whereby said mercury thermostat switch opens causing said transistor to be triggered conductive; and transfer means operable, when energized by said conductive transistor, to open said normally closed first switch means and move said second switch means from its plate refrigerating contact to its freezer plate defrosting contact.



3,859,814

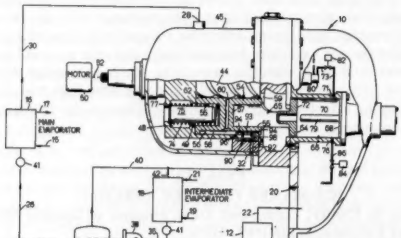
VARIABLE CAPACITY ROTARY SCREW COMPRESSOR

Whitney I. Grant, Muskego, Wis., assignor to Vilter Manufacturing Corporation, Milwaukee, Wis.

Filed Oct. 3, 1973, Ser. No. 403,195

Int. Cl. F25b *1/00*

U.S. Cl. 62—196 **5 Claims**



1. In a refrigeration system including a high pressure condenser, a subcooler for receiving condensed refrigerant from the condenser, a main evaporator for receiving liquid from said subcooler, said subcooler forming some high pressure refrigerant vapor, and a variable capacity multiple inlet compressor having a pair of oppositely rotating constant mesh rotors defining chambers having a primary inlet cut off and which rotors cooperate to provide a pumping and compressing action, a primary inlet for receiving low pressure vapor from said main evaporator, a secondary inlet for receiving high pressure vapor from said subcooler, and a discharge port for discharging high pressure vapor to said condenser, the improvement comprising: a slide valve mounted for movement relative to said rotors, said valve including low pressure vapor cut-off means for controlling the point of cut-off of admission of low pressure vapor to said rotors and the begining of said compression action, and passage means for providing fluid communication between said secondary inlet and said rotors, said passage means being located a fixed distance from said low pressure vapor cut-off means and means for moving said slide valve to vary said cut-off of admission of low pressure vapor and consequently vary the capacity of the compressor.

3,859,815

TWO-STAGE COMPRESSION APPARATUS

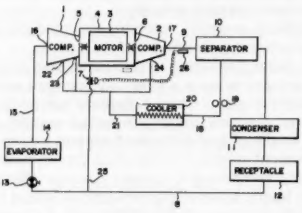
Keisuke Kasahara, Tokyo, Japan, assignor to Kabushiki Kaisha Maekawa Seisakusho, Tokyo, Japan

Filed Mar. 7, 1974, Ser. No. 448,874

Claims priority, application Japan, Oct. 12, 1973, 48-114955

Int. Cl. F25b *31/00*

U.S. Cl. 62—197 **7 Claims**



1. Two-stage compression apparatus comprising an oil injection type of a screw compressor for low compression stage, an oil injection type of a screw compressor for high compression stage, an electric motor for driving both of said compressors, and means for defining a sealed atmosphere around said electric motor, said atmosphere being communicated with a gas exhaust outlet of said compressor for low compression stage and a gas suction inlet of said compressor for high compression stage.

3,859,816

PORTABLE AIR CONDITIONER UNIT FOR USE IN MINES AND OTHER LIKE RESTRICTED AREAS

Howard E. McDonald, 121 E. 7th St., Tucson, Ariz. 85705, and James E. Caffall, P.O. Box 651, Oracle, Ariz. 85623

Filed Jan. 23, 1974, Ser. No. 435,861

Int. Cl. B60h *3/04*

U.S. Cl. 62—239 **5 Claims**

1. A mine cooling unit comprising:

a housing,

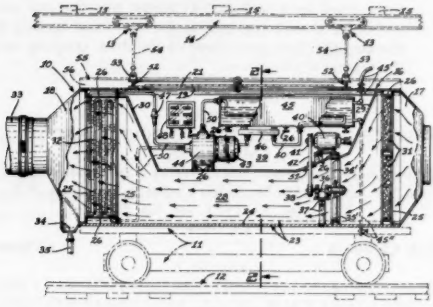
said housing being of a size capable of being positioned in and moved along a mine passageway,

said housing including an air intake, an air outlet and an air passageway extending between said air intake and air outlet at the base of said housing,

a removable filter mounted in said air intake,

a fan positioned in said air passageway adjacent said air intake for drawing air therethrough,

an enclosed chamber arranged in said housing above said air passageway and isolated therefrom,
a motor operatively connected with said fan,
refrigeration apparatus comprising a compressor, a condenser and an evaporator coil,
said compressor and condenser being located in said chamber and said coil being located within said air passageway juxtapositioned to said air outlet,



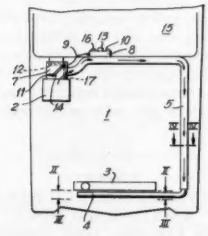
whereby the passage of air through said air passageway is cooled at the air outlet end of said housing to avoid condensation in said housing upstream thereof, and
a drain trap and outlet mounted at the base of said coil downstream thereof for collecting and draining from said housing water condensed by said coil.

3,859,817

AUXILIARY COOLING SYSTEM FOR ENGINE OF AIR CONDITIONED MOTOR VEHICLE

Charles L. Kick, Westwood, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Continuation-in-part of Ser. No. 281,385, Aug. 17, 1972, abandoned. This application Sept. 4, 1973, Ser. No. 394,179
Int. Cl. B60h *3/04*
U.S. Cl. 62—244 **4 Claims**



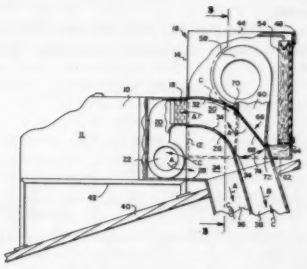
1. An auxiliary cooling system for an engine of an air conditioned motor vehicle having air conditioning means and an engine cooling radiator, said auxiliary cooling system comprising
a perforated tube wound in a substantially planar spiral configuration and positioned in the area of the radiator; insulated conduit means coupled between the air conditioning means and the perforated tube for directing cold air from the air conditioning means into the perforated tube whereby said perforated tube directs the cold air onto the radiator; and
control means enabling the driver to provide auxiliary cooling of the engine via the perforated tube and cold air therein.

3,859,818

COMBINATION REFRIGERATION AND EVAPORATIVE COOLING AIR CONDITIONER

William H. Goettl, 4717 N. Granite Reef Rd., Scottsdale, Ariz. 85251

Filed Apr. 29, 1974, Ser. No. 465,298
Int. Cl. F28d *5/00*
U.S. Cl. 62—311 **8 Claims**



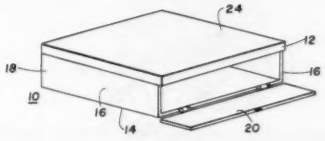
1. In a combination air conditioner adapted to be installed on top of a building roof; an evaporative cooler; a refrigeration air conditioner adjacent to said evaporative cooler; said refrigeration air conditioner having a refrigerant evaporator; said refrigeration air conditioner having first means for forcing air through said refrigerant evaporator; a refrigerated air delivery duct extending from said refrigerant evaporator to receive refrigerated air therefrom; an air return duct adjacent to said delivery duct; said return duct communicating with said first means; said first means disposed to force air from said return duct and through said refrigerant evaporator and into said delivery duct; a blower in said evaporative cooler; said blower provided with a delivery opening communicating with the interiors of both of said ducts; and a pivoted damper pivotally disposed to swing into an open or closed position relative to said blower delivery opening; said damper alternately pivotal into an open or closed position relative to said delivery ducts to thereby permit said blower to deliver evaporatively cooled air concurrently through said delivery duct and said return duct.

3,859,819

REFRIGERANT CONTAINING SANDWICH STORAGE DEVICE

Marx Kaplan, Vineland, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Oct. 4, 1973, Ser. No. 403,495
Int. Cl. F25d *3/08*
U.S. Cl. 62—371 **1 Claim**



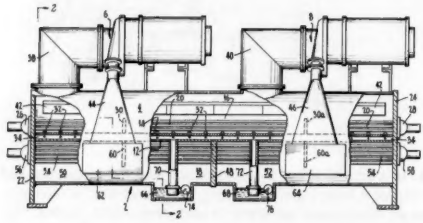
1. A device made to fit in standard size lunch boxes for keeping sandwiches in refrigerated fresh condition, said device comprising:
a hollow rectangular plastic parallelepiped body having first and second vertically spaced parallel horizontal walls interconnected by vertical side and end walls, one of the vertical walls including an access door, the upper horizontal wall being hollow and having an outer portion which is thermally insulated; and

a permanent chemical refrigerant material filling the hollow wall.

3,859,820
COMPRESSOR, CONDENSER, EVAPORATOR STRUCTURE

William Edwin Dobney, Camberwell, Australia, assignor to Applied Air Conditioning Equipment Pty. Ltd., Victoria, Australia

Filed July 12, 1973, Ser. No. 378,719
Claims priority, application Australia, July 17, 1972, 9735/72
Int. Cl. F25b *39/04*
U.S. Cl. 62—506 **10 Claims**

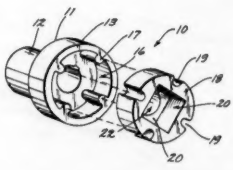


1. A refrigeration machine comprising evaporator and condenser compartments; first and second heat transfer tubes extending through the evaporator and condenser compartments, respectively; baffle means extending transversely across the condenser compartment and sealed to the second heat transfer tubes to form substantially gas-tight divisions defining separate condenser chambers within the condenser compartment; two compressors each having an input and an output, the respective inputs of the two compressors being in communication with the evaporator compartment, the outputs of the two compressors being in communication, respectively, with separate ones of the two separate condenser chambers; and return means for returning condensed refrigerant fluid from each condenser chamber to the evaporator compartment.

3,859,821
FLEXIBLE COUPLING

Joseph E. Wallace, Creston, Iowa, assignor to Vanmark Corporation, Creston, Iowa

Continuation of Ser. No. 265,362, June 22, 1972, abandoned. This application Nov. 1, 1973, Ser. No. 411,722
Int. Cl. F16d *3/17*
U.S. Cl. 64—11 R **9 Claims**

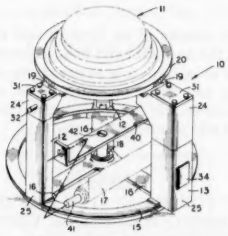


1. A flexible drive coupling for transmitting power from a drive shaft to a driven shaft comprising:
a main coupling member;
a hub section forming a part of the main coupling member and adapted to receive and rotate with a first shaft;
a flange section forming a part of the main coupling member and being adapted to receive a shaped insert therein;
a shaped torque-transmitting insert formed of a resilient material disposed within the flange section of the main coupling member, the insert having a central non-circular shaft-receiving opening;
a non-circular second shaft having one end thereof received in a mating relationship inside said opening;
support means on the other end of said second shaft for rotatably mounting the second shaft and thereby holding the said one end of the second shaft into the opening; and means for permitting said other end of said second shaft to be lifted from said support means whereby said one end of the second shaft may be slid out of said opening to thereby effect an uncoupling of the drive coupling and the second shaft.

3,859,822
SPLIT SUPPORT FRAME FOR CIRCULAR KNITTING MACHINES

Philip Renda, Brentwood, and Lawrence Rozett, Flushing, both of N.Y., assignors to The Singer Company, New York, N.Y.

Filed Sept. 17, 1973, Ser. No. 398,026
Int. Cl. D04b *9/00*
U.S. Cl. 66—8 **6 Claims**



1. A split leg support frame for the knitting elements and fabric take-up mechanism of a circular knitting machine including an outer ring, comprising a plurality of circumferentially spaced non-drive and drive leg members, each of said leg members being formed by an upper gear box section adapted to support the outer ring of the machine and a lower spacer section separable therefrom, said leg members being positioned radially to accommodate said fabric take-up mechanism therebetween, and means associated with said leg members for supporting said take-up mechanism, the lower sections of said leg members being replaceable by corresponding lower sections of different height in order to provide required vertical clearance between said outer ring and take-up mechanism support means for take-up mechanisms of various heights.

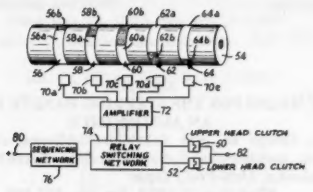
3,859,823
CONTROL SYSTEM FOR HIGH PILE CIRCULAR KNITTING MACHINES

Crawford M. Ellis, LaFollette, Tenn., assignor to United Merchants and Manufacturers, Inc., New York, N.Y.

Filed Apr. 11, 1972, Ser. No. 243,036
Int. Cl. D04b *9/14*
U.S. Cl. 66—9 B **7 Claims**

1. In a circular high pile knitting machine including a rotatable knitting cylinder for knitting fibers and yarn fed thereto into a high pile fabric, said fibers being incorporated in the form of a pile into a backing layer formed of said yarn, means for feeding yarn to said cylinder, and at least one carding means including a plurality of selectively operable fiber feeding means for delivering fibers of at least two different types to said cylinder, the combination comprising program means for said one carding means including a plurality of different control programs, selection means including a plurality of means responsive to rotation of said knitting cylinder each

individually related to one of said control programs and operable to individually select said control programs in accordance with knitting cylinder rotation in a predetermined order comprising any desired sequence, and control means for serially



applying said selected programs in the order selected as control functions to said one carding means to determine in accordance with said selected programs the ratio of each of said types of fiber which is fed to said knitting cylinder by each of said fiber feeding means.

3,859,824

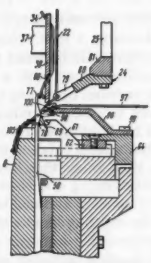
CIRCULAR KNITTING MACHINE FOR MAKING WEFT KNITTED FABRICS INCLUDING WARP YARNS AND WEFT YARNS INTERCONNECTED BY GROUND LOOPS

Alexandr Iosifovich Krylov, ulitsa Reznitskaya, 11, 22; Vladimir Semenovich Myshko, Bulvar Druzhbnarodov, 10, kv. 52; Leonid Stepanovich Smirnov, Ilsta Poligraficheskaya, 30, kv. 128; Jury Ivanovich Maslennikov, prospekt 50- letia Oktyabraya, 23, kv. 107; Igor Makarovich Vikulov, Prozd Fizkulturny, 6, kv. 5; Alexandr Nikolaevich Gontarenko, ulitsa Krasnoarmeiskaya, 122, kv. 2, all of Kiev; Alexandr Dmitrievich Korovyanko, ulitsa R. Okipnoi 7, kv. 35, and Valery Pavlovich Zaitsev, ulitsa K Marxa, 12, kv. 22, both of Chernovtsy, all of U.S.S.R.

Filed Apr. 2, 1973, Ser. No. 346,910

Int. Cl. D04b *9/16, 9/18, 15/06*

U.S. Cl. 66—10 **3 Claims**



1. A circular knitting machine for making weft knitted fabrics including warp yarns and weft yarns interconnected by ground yarns, comprising: a framework; creels, respectively, with supplies of weft yarn and ground yarn mounted on said framework in the form of coaxial rings; beams with a supply of warp yarn mounted on said framework; a needle cylinder mounted on said framework beneath said beam and said creels coaxially therewith, in which way the vertical geometric axis of said machine is defined; vertical grooves made in said needle cylinder; latch needles having heads, received in said vertical grooves and also having backs facing said needle cylinder; a sinker bed arranged about said needle cylinder and secured thereto; grooves made in said sinker bed and extending radially toward said geometric axis of said machine; sinkers received in said grooves of said sinker bed intermediate of said latch needles, each said sinker having a body; needle cam boxes arranged about said needle cylinder and encircling said cylinder; sinker cam boxes arranged on said sinker bed; means for effective relative rotation of said cylinder with respect to said cam boxes; a channel defined by said needle cam boxes and having inclined portions and horizontal portions; a horizontal channel defined by said sinker cam boxes; butts provided on said latch needles and received in said channel defined by said needle cam boxes to effect reciprocation of said needles upon said relative rotation of said cylinder and said cam boxes; butts provided on said sinkers and received in said channel defined by said sinker cam boxes to effect radial reciprocation of said sinkers relative to said geometric axis of said machine upon said relative rotation of said cylinder and said cam boxes; warp yarn guiding means including an annular comb mounted above said needle cylinder; ground yarn guiding means disposed interiorly of said annular comb and including yarn guides with outlets, said yarn guides being disposed so that said outlets thereof are positioned below the level of said heads of said needles as the latter are raised in operation to their topmost position, to guide said ground yarns into said heads of said needles and to make said ground yarns encircle said warp yarns; weft yarn guiding means including weft yarn guides mounted exteriorly of said annular comb; each said sinker having a bifurcated hook presenting a V-shaped mouth, said hook being located above the body of said sinker, said mouth thereof being adapted, as said sinker is moved toward said geometric axis of said machine, to receive therein said warp yarn; a throat of each said sinker defined between said hook thereof and said body thereof, said throat being adapted to receive said weft yarn and to guide said weft yarn behind said backs of said needles, when said heads of said needles are positioned below said body of said sinkers, as said needles are being raised in operation, said throat being further adapted to retain said weft yarns and the links of the loops of said ground yarn, when said heads of said needles are raised in operation above said body of said sinker; said weft yarn guides having outlets and being arranged so that said outlets thereof are disposed at the level of said throats of said sinkers, directly adjacent to a point at which said sinkers start their stroke toward said geometric axis of said machine.

3,859,825

NARROW FABRICS

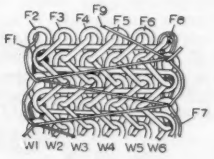
Bernard Marie Foulquies; Reginald Ernest Capell, and Brian Crookes, all of Shepshed, England, assignors to Parema Limited, Leicester, England

Filed July 23, 1973, Ser. No. 381,488

Claims priority, application Great Britain, July 29, 1972, 35599/72

Int. Cl. D04b *23/08*

U.S. Cl. 66—192 **31 Claims**



1. Warp knitted fabric including first yarns; at least 4 wales formed by the first yarns of lengthwise extending rows of loops, held in a side-by-side relationship between longitudinal edges of the fabric by transversely extending portions of the first yarns; and a contracted second yarn joined by knitting about the first yarns with a pair of the wales spaced apart by at least two others of the wales held between the pair by the transversely extending portions of the first yarns, which second yarn has portions extending transversely past the other wales between the pair of wales and urges the pair of wales against one another, bends the fabric longitudinally across the

other wales between the pair of wales and locates the longitudinal edges of the fabric in close mutual proximity.

3,859,826

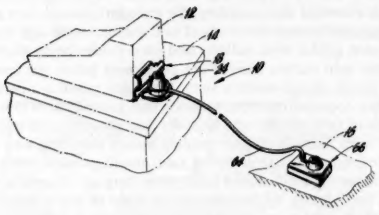
APPARATUS FOR SECURING OFFICE EQUIPMENT AT A REMOTE STATION

M. Leonard Singer, 1500 Cardinal Dr., Little Falls, and Robert M. Woletz, 294 Buttonwood Dr., Paramus, both of N.J.

Filed Feb. 21, 1973, Ser. No. 334,276

Int. Cl. E05b *73/00*

U.S. Cl. 70—58 **17 Claims**



1. A device for locking office equipment to a fixed base which is adapted to engage through a securing eyelet of the equipment, comprising a securement member having a base portion and a shank portion of smaller dimension then said base portion engagable through the securement eyelet and extending outwardly therefrom, a connecting collar engaged over said shank portion and carrying a connecting cable, a locking member telescopically engaged with said shank portion over said collar, said locking member and said securement member having a key operated interengagable latch means for latching said locking member to said securement member to hold said collar therebetween, said cable having an opposite end with means for locking it to a fixed base.

3,859,827

IMPROVEMENTS IN DOUBLE ACTION CYLINDER OR CIRCULAR LOCKS, APPLICABLE TO DOORS AND SIMILAR OBJECTS

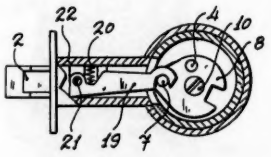
Francisco Estepa Garcia, Madrid, Spain, assignor to Patentes Fac, S.A., Madrid, Spain

Filed Aug. 8, 1973, Ser. No. 386,701

Claims priority, application Spain, Aug. 8, 1972, 405665

Int. Cl. E05b *55/00*

U.S. Cl. 70—143 **8 Claims**



1. In a double action cylinder lock of the type applicable to doors and similar structures, said lock having at least one doorknob, a doorknob actuator assembly, and a bar slideable in a casing, and wherein said doorknob actuator assembly is fitted for insertion into an opening in the plane of the door or similar structure and said bar and bar casing are fitted for insertion into an orifice through the edge of the door or similar structure, said orifice meeting with and oriented normal to said opening, the improvement in which:

said doorknob and doorknob actuator assembly form a unitary structure;

said doorknob is sized to fit through said opening without disassembly from said unitary structure; and

said doorknob actuator assembly comprises means for fixedly receiving the inner end of said bar casing, and means for coupling said doorknob actuator assembly to said bar.

3,859,828

LOCK MEANS FOR THE STEERING HANDLE SHAFT OF AN AUTOMOBILE

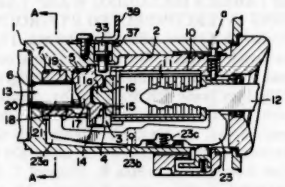
Ibuka; Shinya Ito, and Takehiko Nishikawa, all of Aichi, Japan, assignors to Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho, Aichi-Pref., Japan

Filed Mar. 2, 1973, Ser. No. 337,408

Claims priority, application Japan, Mar. 11, 1972, 47-25136

Int. Cl. B60r *25/02*

U.S. Cl. 70—252 **1 Claim**



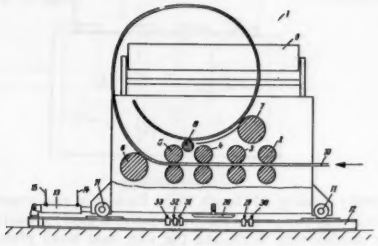
1. A lock means for a steering handle shaft of an automobile, comprising a housing, a lock releasing member in said housing rotatable reciprocally between a lock position and a starter actuating position along with a rotary member of a cylinder lock, a lock member operating in association with the operation of said lock releasing member to lock the steering handle shaft, means for holding said rotary member and said lock releasing member against rotation to the lock position for the steering handle shaft other than when the automobile is parked, means for maintaining said holding means in the state of holding said rotary member and said lock releasing member against rotation to the steering handle shaft locking position, a restricting pin reciprocable between said holding position and an inoperative position included in said holding means and biased to said inoperative position, and a stopper for cooperation with said restricting pin provided on said lock releasing member, said maintaining means including a press lever disposed on a bracket fixed to the housing in a manner to be rotatable about a pivot thereof and having one end in contact with an end of the restricting pin and the other end connected with an end of an operating wire by means of a clamp, said operating wire having an end member at its other end, a compression coil spring in contact with said end member and urging same and said wire in a direction such that said one end of said press lever retains said restricting pin in said holding position, and a press member attached to a portion of a shift lever of said automobile and operably associated with said end member, said press member being operable to move said end member against the extensible force of said spring to permit rotation of said press lever about said pivot and movement of said restricting pin to said inoperative position under its bias when the shift lever is moved to a parking position.

3,859,829

LOOSE BAND COILER FOR USE WITH HORIZONTAL CONTINUOUS CASTING MACHINE

Heribert A. Krall, Wurzberg, and Helmut Maag, Hochberg, both of Germany, assignors to Technica-Guss GmbH, Friedrich-Koening, Germany

Filed July 16, 1973, Ser. No. 379,889
Claims priority, application Germany, July 19, 1972, 2236388
Int. Cl. B21b *37/12*; B21c *47/00*
U.S. Cl. 72—9 21 Claims



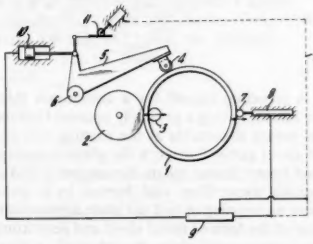
1. A loose band coiler for use with a horizontal continuous casting machine, said coiler being mounted on wheels for movement towards and away from the casting machine, said coiler having coiling means for coiling the cast strand, control means connected with the coiling means for controlling the coiling speed dependent on the strand drawing speed and dependent on the travel movement of said loose band coiler.

3,859,830

RING ROLLING MILL

Josef Jeuken, Holzwickede; Gustav Vieregge, Dortmund-Wambel, and Wolfgang Massberg, Dortmu ND-Wellinghofen, all of Germany, assignors to Rheinstahl AG, Essen, Germany

Filed May 7, 1973, Ser. No. 357,777
Claims priority, application Germany, May 9, 1972, 2222607
Int. Cl. B21h *1/06*
U.S. Cl. 72—10 14 Claims



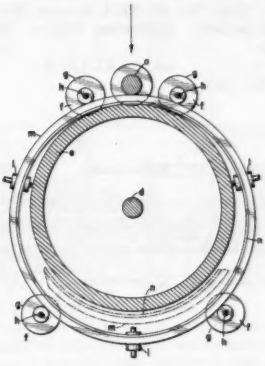
1. In a ring rolling machine effecting an increase in the diameter of ring-shaped workpieces by reduction in the distance between two radial working rolls operating on respective opposite peripheries of the workpiece to decrease its radial thickness and the distance between two axial working rolls acting on respective opposite edge surfaces of the workpiece to decrease its axial thickness, with at least one working roll of each pair being driven and with at least one pair of rolls being mounted for displacement in the longitudinal direction of the ring rolling machine, the improvement comprising, in combination, at least one centering roll engageable with the periphery of the workpiece; respective actuating members associated with each centering roll and operable to displace the associated centering roll in accordance with the increasing diameter of the ring-shaped workpiece; at least one first feeler detecting the instantaneous diameter of the workpiece and controlling said actuating members; a further actuating member operatively associated with at least one of said rolls; and a further feeler positioned outside the plane including the axes of the two radial working rolls, for detecting an unsymmetrical position of the workpiece relative to said plane, and controlling said further actuating member to effect the return of the workpiece into its symmetrical position relative to said plane.

3,859,831

METHOD OF PRODUCING COMPOSITE BUSHINGS AND BEARINGS

Franz D. Timmermans, Brunswiker Str. 11 a, 23 Kiel, Germany

Filed Jan. 29, 1970, Ser. No. 9,135The portion of the term of this patent subsequent to Oct. 14, 1991, has been disclaimed.
Int. Cl. B21b *3/00*
U.S. Cl. 72—68 2 Claims



1. A method of rolling steel cylinders which are internally lined with a bearing metal including the steps of arranging a steel cylinder internally lined with a bearing metal within a gap formed by a pair of juxtaposed rolls of which one roll has a relatively small diameter and the other roll has a relatively large diameter, thereafter applying a relatively large pressure by said roll of relatively small diameter against the outer surface of said steel cylinder and of applying a relatively small pressure by said roll of relatively large diameter against said inner bearing-metal-lined surface of said steel cylinder and causing said pair of rolls to rotate while applying pressure against said outer surface and against said inner surface of said steel cylinder, cutting said steel cylinder open upon rolling thereof, and causing said steel cylinder to assume a planar shape after having been cut open.

3,859,832

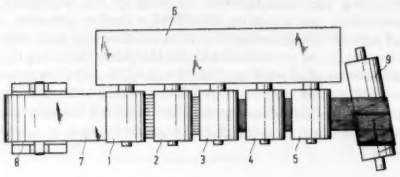
CORRUGATED SHEET MATERIAL

Emil Siegwart, Strasse 6, 6603 Sulzbach-Neuweiler, Germany

Filed June 8, 1973, Ser. No. 368,216
Claims priority, application Germany, June 12, 1972, 2228496
Int. Cl. B21d *13/04*
U.S. Cl. 72—180 6 Claims

1. A method of manufacturing a thin, corrugated sheet or strip comprising the steps of (a) taking a flat sheet of material, (b) imparting to said sheet a series of corrugations which are coarser and wider than the corrugations finally required, (c)

impressing at least one smaller counter-corrugation in the crest of each of said wide corrugations and (d) deepening said



counter-corrugations until all the corrugations are of substantially the same height.

3,859,833

SWAGING MACHINE FOR TUBULAR WORKPIECES, WITH REGULATION OF THE THICKNESS

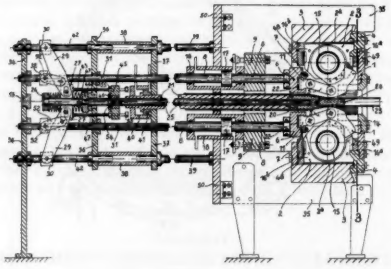
Pierre Cuq, Firminy, France, assignor to Agence Nationale de Valorisation de la Recherche "Anvar", Neuilly, France

Filed May 25, 1973, Ser. No. 364,176

Claims priority, application France, May 26, 1972, 72.18906

Int. Cl. B21j *9/06*

U.S. Cl. 72—189 **6 Claims**



1. A swaging machine comprising a pilot mandrel, pivoted sectors disposed radially with respect to the pilot mandrel, said sectors having curvilinear inwardly directed edges, said sectors being slightly inclined with respect to vertical planes passing through the axis of the pilot mandrel, means to pivot the sectors in a working stroke to bring their curvilinear edges into contact with the exterior of an article whose mouth is placed on the pilot mandrel, a finishing mandrel adapted to project beyond the pilot mandrel as the mouth of the article is swaged by being drawn from the pilot mandrel by the sectors and upon which finishing mandrel the swaged mouth is rolled by said sectors, means for positively driving said pilot mandrel in alternate forwards and backwards movement in synchronizm with the pivoting of said sectors, and guide means for said sectors disposed in the immediate vicinity of the curvilinear edges thereof, said guide means comprising a ring having slots to receive and guide said sectors during the working stroke.

3,859,834

MANUALLY OPERATED CORNER BENDING DEVICE

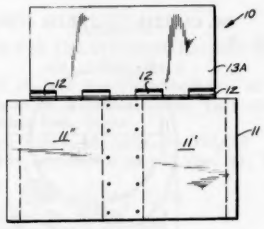
Robert Riley, 1804 Weltin St., Orlando, Fla. 32803

Filed Oct. 16, 1972, Ser. No. 297,967

Int. Cl. B21d *11/20*

U.S. Cl. 72—319 **1 Claim**

1. A manually operated corner bending device, comprising in combination, a large, rectangular, hardened metal plate, a small rectangular, hard metal plate, and a hinge pivotally securing said plates together so to form and forcibly urge corners into sheet metal, said large rectangular plate including lip means on each end which serve as stop means for said sheet metal being formed, each said lip means comprising a flange turned up at right angle to a flat plane or said large plate, said plates in combination forming a means for abutting and frictionally causing 90° bends to be formed in said sheet metal which may comprise a material such as is used for heating and sir conditioning ducts and the like, said small plate being pivotally urged towards said larger plate when said sheet metal is in place so to produce a 90° bend on edges of said sheet metal placed thereon.



3,859,835

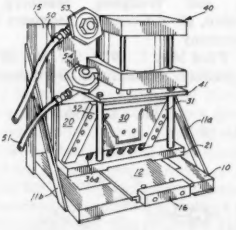
CUT OFF FOR CONTINUOUS SHEET METAL FORMER

Jeral D. Allen, Littleton, Colo., assignor to Waterite Industries, Inc., Denver, Colo.

Filed July 27, 1973, Ser. No. 383,087

Int. Cl. B21d *43/28*

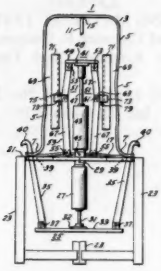
U.S. Cl. 72—324 **5 Claims**



1. A traveling cut-off for a continuous thin sheet metal gutter former having a generally squared U-shape, comprising frame means mountable at the existing end of a continuous sheet metal gutter former; a die plate reciprocably mounted on said frame means; means for returning said die plate from a position away from said former to a position aujacent thereto; an opening in said die plate approximating the cross-section of the formed metal sheet and permitting free passage of the formed metal sheet therethrough; a shear plate juxtaposed against said die plate and arranged to move at an angle to the vertical thereacross, there being an opening in said shear plate similar to the shape of the opening in said die plate and of a larger size and off-set from the die plate opening, whereby initial movement of said shear plate clamps and holds the sheet metal and inner edge of the opening in said shear plate is offset for the die plate to provide a progressive shear action on the formed metal sheet; means supporting said shear plate adjacent said die plate and permitting diagonal reciprocable movement therealong; means for returning said shear plate from a lower position to an upper position with the openings in register; a power cylinder, having a piston rod, mounted on said die plate and movable therewith, and said

piston arranged to press downwardly on said shear blade; and means for actuating said cylinder.

3,859,836
STRAIGHTENER FOR A DISPENSER FOR COILED MATERIAL
Gregory Speros, Downey, Calif., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.
Filed May 18, 1973, Ser. No. 361,681
Int. Cl. B21d *41/00*
U.S. Cl. 72—399 **8 Claims**



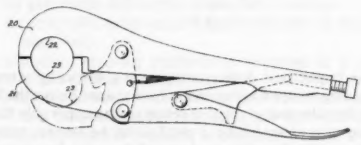
1. For straightening a dispensing device for coiled material which comprises spaced side rods forming inverted U-shaped body members joined at the apexes thereof, said side rods terminating in base ends and a base member connecting said base ends in a plane substantially perpendicular to the plane of said side rods, a straightener comprising:

a. support means for supporting said base member;

b. base member straightening means fastened to said support means for engaging and straightening said base member by forcing said base member against said support means; and

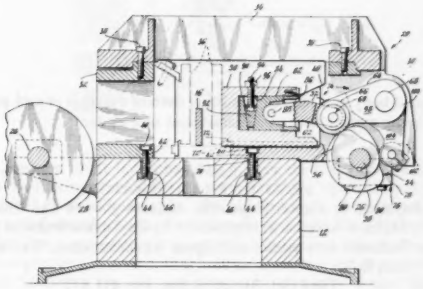
c. side rod straightening means independent of said base member straightening means fastened to said support means for engaging and forcing outwardly said side rods.

3,859,837
TOOL FOR SECURING CONDUIT ENDS
Elvin O. Burroughs, Rt. 2, Box 207, Dexter, Oreg. 97431
Filed Apr. 18, 1973, Ser. No. 352,093
Int. Cl. B21d *37/12*
U.S. Cl. 72—410 **1 Claim**



1. A hand tool for applying a collapsible collar about the end of a resilient conduit to reduce the collar and hence the conduit end into gripping engagement with an internally disposed member, said hand tool including a pair of opposed jaws adapted for relative opening and closing movement, each of said jaws having a curved collar reducing wall formed on equal radii for initial placement in an opposed spaced apart manner on the collar, each of said jaw walls terminating in outwardly directed chordal walls, said chordal walls being in surfacial abutment with one another when the jaws are in a closed position about a reduced collar whereby collar reduction is limited with subsequent application of the jaws to other circumferential collar surfaces further reducing the collar while tending to return same to circular configuration.

3,859,838
TOGGLE ACTUATED HORIZONTAL PRESS
George D. Karsnak, Muncie, Ind., assignor to The U.S. Baird Corporation, Strafford, Conn.
Filed Apr. 12, 1973, Ser. No. 350,650
Int. Cl. B21j *9/18*
U.S. Cl. 72—451 **5 Claims**



1. A press head for operating across a process line on a metal fabricating machine, comprising:

a housing including means for detachably securing to the machine;

a ram slideably retained in said housing; and

a toggle linkage between said ram and said housing, said toggle linkage having a drive link and a crank link interconnected at a knuckle joint, said drive link extending from said knuckle joint to said ram and being pivotally affixed thereto, said crank link extending from said knuckle joint to said housing and being pivotally affixed thereto, said ram being advanced when forces are applied at said knuckle joint to straighten said toggle linkage, said knuckle joint moving within said toggle linkage to release bending moments in said drive link and said crank link, said toggle linkage developing a mechanical advantage to deliver magnified forces at said ram.

3,859,839
SYSTEM AND DEVICE FOR AVOIDING ANY CHANGE OF THE CROSS SECTION OF TUBULAR BODIES DURING THEIR COLD BENDING
Piero Crotti, Bologna, Italy, assignor to Camar S.A., Roveredo/Graubunden, Switzerland
Filed July 9, 1973, Ser. No. 377,732
Claims priority, application Italy, Sept. 18, 1972, 52811/72
Int. Cl. B21d *9/01*
U.S. Cl. 72—465 **1 Claim**

1. A pipe-bending mandrel receivable in a pipe of a predetermined diameter to permit bending thereof without collapse, said mandrel comprising a flat elongated body having a pair of terminal members of a width less than said diameter, and a pair of elongated shanks interconnecting said members and defining between them a longitudinally-extended throughgoing slot, said shanks having inner parallel walls defining said slot in a relaxed position of said body outside said pipe, but being of increasing cross-section from said members toward the center of said body whereby upon inward deflection of

said shanks, the solid width of said body at said center corresponds substantially to the diameter of said pipe, the width of

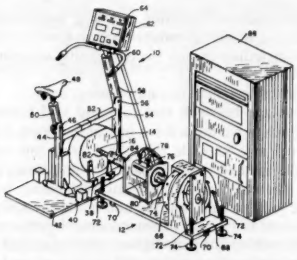
said body in a relaxed condition thereof external of said pipe being greater than said diameter at said center.

3,859,840

ERGOMETER CALIBRATOR

Raymond L. Gause, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 31, 1973, Ser. No. 411,572
Int. Cl. G01l *25/00*
U.S. Cl. 73—1 R **3 Claims**



1. An apparatus for providing a dynamic calibration over a given speed range for an ergometer having a rotatable shaft coupled to a D.C. generator, a variable resistance load coupled to said generator, a first torque sensor sensing the torque required to rotate said shaft, a first tachometer for sensing the rate of rotation of said shaft, and means coupled to said first torque sensor and said first tachometer for generating an electrical signal representing the work being performed by the ergometer, said apparatus comprising:

a. a D.C. motor adapted to be coupled to said shaft for rotating said shaft;

b. a second torque sensor coupled to said shaft producing a torque signal indicating the torque required to rotate said shaft;

c. a second tachometer coupled to said shaft generating an electrical signal indicating the speed of rotation of the shaft;

d. means coupled to said second torque sensor and said second tachometer for generating an electrical signal indicating the work being performed by said D.C. motor in rotating said shaft;

e. a speed controller coupled to said D.C. motor for causing said D.C. motor to be rotated at predetermined speeds, and

f. a feedback circuit coupled between said second tachometer and said speed controller supplying a signal to said speed controller so as to maintain the rate of rotation of said D.C. motor constant for a predetermined setting of said speed controller,

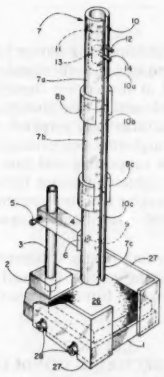
whereby by comparing the electrical signal representing work generated by said ergometer with said electrical signal of said apparatus at various speeds of rotation of said shafts it can be determined if said ergometer requres calibration.

3,859,841

CUSHIONING MATERIAL TEST DEVICE

Ernest C. Evans, and Clarence E. Gurnee, both of Appleton, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 11, 1972, Ser. No. 252,243
Int. Cl. G01n *3/30*
U.S. Cl. 73—12 **5 Claims**

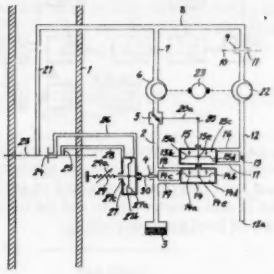


1. An impact test device comprising a vertically extending tube having an open lower end, a base spaced below the lower end of the tube and adapted to retain on the upper side thereof fronting toward said tube a product to be impact tested, a capsule confined within the bore of the tube for movement axially of the tube toward the open tube end, said capsule being of such an axial dimension that it may project through the said lower open tube end to impact a product on the base while the upper end of the capsule is retained within the tube, a shuttle confined within the capsule of lesser axial dimension than the capsule and capable of movement axially from an upper end of the capsule toward a lower end of the capsule, cooperable means carried by the shuttle and capsule for releasably retaining the shuttle at an upper end of the capsule, means independent of the capsule for raising the shuttle from a released position to the secured position at the upper end of the capsule and means independent of the shuttle for raising the capsule with the shuttle therein upwardly in the said tube.

3,859,842
SYSTEM FOR DETERMINING THE DUST CONTENT OF GASES

Julius Bosch, Rathsberg Bei Erlangen, Germany, assignor to Frieseke & Hopfner GmbH Erlangen-Bruck, Erlangen, Germany

Filed Aug. 1, 1973, Ser. No. 384,572
Claims priority, application Germany, Aug. 1, 1972, 2237736
Int. Cl. G01n *31/00*
U.S. Cl. 73—28 **3 Claims**



1. A system for measuring the dust content of a gas stream traversing a duct, said system comprising:

a pair of motor-driven pumps, each having an inlet and an outlet, the inlet of one of said pumps and the outlet of the other pump forming respective branches communicating with the atmosphere;

a dust detector having an input side connected to the outlet of said one of said pumps and an output side connected to the inlet of said other pump;

a sampling tube open into said duct and communicating with said input side of said dust detector downstream of said one of said pumps;

a first hrottle located at said inlet branch downstream of its communication with the atmosphere and a second throttle located at said outlet branch upstream of its communication with the atmosphere;

means for varying the effective flow cross section of one of said throttles;

operating means responsive to the flow velocity of said gas stream in said duct and operatively connected to said means for varying said cross section for adjusting said cross section of said one of said throttles to generate a flow-rate differential between said inlet branch and said outlet branch in dependence upon said flow velocity; and

an automatic differential controller including:

an adjustable-cross section further throttle in one of said branches,

a control member shiftable in response to a pressure differential across said branches, and

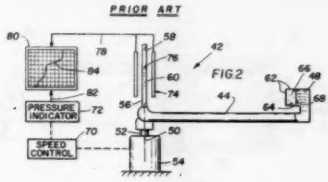
means operatively connecting said control member to said first throttle for increasing the flow-rate differential across said branches in conjunction with said operating means upon an increase in said flow velocity and vice versa.

3,859,843
APPARATUS FOR MEASURING SURFACES BY MERCURY INTRUSION

Seymour Lowell, 42 Wood Hollow Rd., Albertson, N.Y. 11501

Filed Nov. 10, 1972, Ser. No. 305,519
Int. Cl. G01n *15/08*
U.S. Cl. 73—38 **1 Claim**

1. An apparatus for intruding measured quantities of a fluid at selected pressures into penetrating relation with a porous test surface comprising a rotatably mounted conduit means defining a flow passage for said intruding fluid terminating in opposite proximal and distal operative ends, wall means at said distal end in communication with said flow passage defining a storage chamber for said test surface, transparent wall means at said proximal end in communication with said flow passage bounding a storage compartment for said intruding fluid, sensing means operatively arranged at said proximal end adapted to maintain visual supervision of said intruding fluid in said transparent storage compartment so as to indicate any volume changes therein, said fluid storage compartment being of a comparatively small cross-sectional area so as to manifest any fluid volume change therein as a comparatively large

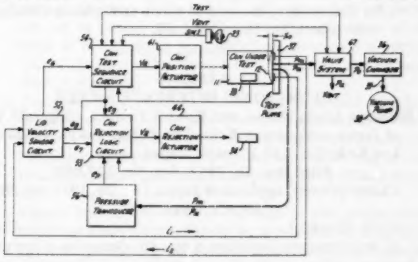


movement of the level of said fluid along the longitudinal axis of said compartment, speed-control means operatively arranged to provide rotation of said conduit means at known selected speeds causing intruding flow of said fluid through said flow passage into said test surface, whereby said intruding flow produces corresponding volume changes in said fluid that are measured by said sensing means, a display means for displaying said measured quantities of intruded fluid and said selected pressures corresponding to said rotational speeds of said conduit means, and means connected from said speed-control means and from said sensing means to operate said display means.

3,859,844
SEALED CONTAINER PRESSURE GAUGING APPARATUS AND METHOD

Ronald J. Hruby, Campbell, Calif., assignor to Material Metrics, Inc., Mountain View, Calif.

Filed Mar. 23, 1973, Ser. No. 344,413
Int. Cl. G01m *3/36*
U.S. Cl. 73—45.4 **16 Claims**



1. In a pressure gauging system for determining the internal pressure in a sealed container having a flexible wall, means cooperating with said flexible wall forming a chamber therewith, means for introducing a pressure to said chamber to cause said flexible wall to move as the pressure in said chamber equalizes with the internal pressure, and means responsive to initial velocity of said flexible wall as it flexes said last named means spaced from said flexible wall and providing a first electrical signal indicative of initial wall velocity, a pressure transducer responsive to the pressure in said chamber and providing a second electrical signal indicative thereof, and means for sampling said second electrical signal actuated by said first electrical signal, whereby the internal pressure deter-

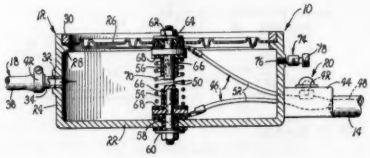
mination is independent of the distance through which said flexible wall moves.

3,859,845

LEAK DETECTOR

James T. Sawyer, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 5, 1973, Ser. No. 337,816
Int. Cl. G01m *3/26*
U.S. Cl. 73—49.2 **3 Claims**



1. An improved portable detector for sensing leaks of pneumatic fluid through a substantially sealed body comprising:

a. an hermetically sealed housing confining a predetermined pneumatic pressure;

b. said housing comprising a flexible wall and a rigid wall, said walls being opposite each other;

c. means for altering the pressure within said housing including a connector adapted to couple the housing in direct communication with an opening formed within a selected, substantially sealed body having a flow of fluid established therethrough;

d. an electrical circuit including a pair of electrical contacts located within said housing;

e. said flexible wall supporting one contact of said pair of contacts for movement from a first position along a substantially linear path to a second position in response to an altering of the pneumatic pressure within said housing;

f. said other of said pair of contacts being supported by said rigid wall;

g. means for providing a visual indication of the position of said one contact;

h. means including a needle valve in the wall of said housing for determining the rate at which said pressure is altered when a leak has been detected.

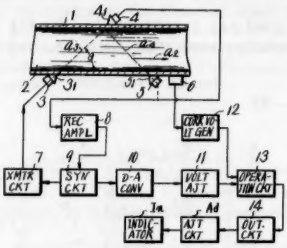
3,859,846

ULTRASONIC INTERFACE METER

Hidekazu Asada, Tokyo, and Kohzoh Tamura, Chigasaki, both of Japan, assignors to Kabushiki Kaisha Tokyo Keikio (Tokyo Keiki Co., Ltd.), Tokyo, Japan

Filed Dec. 20, 1972, Ser. No. 317,098
Claims priority, application Japan, Dec. 26, 1971, 46-3827
Int. Cl. G01n *3/00*
U.S. Cl. 73—67.7 **7 Claims**

1. An ultrasonic interface meter for detecting a boundary between different liquids comprising, an ultrasonic wave transmitting element mounted on a pipe through which liquid is transferred, a signal transmitter circuit for periodically applying an electrical signal to said ultrasonic wave transmitting element which then produces a corresponding ultrasonic wave in a direction oblique to the flow direction of said liquid in said pipe, an ultrasonic wave receiving element mounted on said pipe at a position so as to receive the ultrasonic wave emitted from said ultrasonic wave transmitting element after it has passed through said liquid in said pipe and producing an electrical output signal, an output electrical circuit receiving the electrical output signal from said ultrasonic wave receiving element and controlling the period of said signal applied to said ultrasonic wave transmitting element and generating a sing-around frequency, an adjuster circuit connected to the output of said output electrical circuit and including an integrator circuit receiving an output of said output electrical circuit, a differential amplifier receiving an output of said output electrical circuit and the output of said integrator



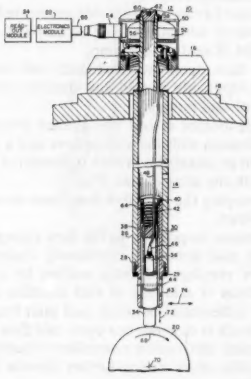
circuit, a pair of level detector circuits receiving the output of said differential amplifier, an inverter receiving the output of one of said level detector circuits, and an indicator receiving the output of said inverter circuit and the output of the other of said pair of level detector circuits.

3,859,847

VIBRATION MONITORING DEVICE USING ACCELEROMETER TO MEASURE DISPLACEMENT

David C. Ronemus, Hatfield, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 6, 1972, Ser. No. 286,623
Int. Cl. G01h *1/00*
U.S. Cl. 73—70 **11 Claims**



1. A vibration monitoring device for monitoring the radial vibratory motion of a rotating shaft in an apparatus relative to an inertial frame of reference, where the rotating surface of the shaft is radially spaced from the surface of the apparatus in a plane generally transverse to the axis of the shaft by a distance which is relatively large when compared with the diameter of the shaft, where a communicating channel of relatively small cross-section when compared with the diameter of the shaft is present between the apparatus surface and the shaft surface for thereby providing access to the shaft surface from the apparatus surface for monitoring the vibratory motion of the shaft, comprising:

indicating means disposed outside of said channel;

an absolute vibration measuring transducer disposed in said channel and electrically connected to said indicating means for converting mechanical movement which is provided to said transducer into an electrical signal which signal is provided to said indicating means to give an

indication of the magnitude of said mechanical movement; and

a unitary shaft rider disposed in said channel but not affixed thereto comprising a generally homogeneous structural material, one portion of which is disposed in physical contact with said transducer and generally is the only means of support for said transducer and another portion which is generally disposed against said shaft for the purpose of transmitting a portion of the mechanical vibratory movement of said shaft relative to said inertial frame of reference at any instant of time to said transducer, said entire transducer being generally only radially movable relative to said shaft in said channel during coversion of said mechanical motion to said electrical signal.

3,859,848

TEST FRAME WITH SELECTIVELY POSITIONABLE SPECIMEN HOLDERS

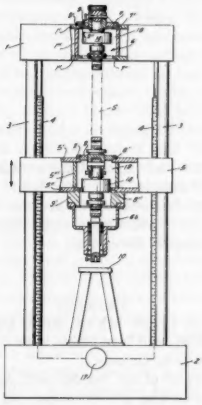
Manfred Dripke, Rottenacker, Germany, assignor to Zwick & Co. Kommanditgesellschaft, Einisingen, Germany

Filed July 30, 1973, Ser. No. 383,536

Claims priority, application Germany, Aug. 11, 1972, 2239553

Int. Cl. G01n *3/04*

U.S. Cl. 73—93 **6 Claims**



1. A test frame, e.g., for the tensional or compressive stressing of a specimen, comprising:

a stationary lower transverse end element;

a stationary upper transverse end element spaced above said lower end element;

a plurality of parallel tie rods connected to and extending between said end elements and perpendicular thereto;

an intermediate transverse element guided on said tie rods and having an upper face turned toward said upper element being formed with a throughgoing hole parallel to said tie rods and on both faces at said hole with a respective annular seat around said hole;

a first sample holder selectively securable to one of said seats of said intermediate element;

means for releasably securing said holder selectively to one of said seats;

a second sample holder securable to at least one of said end elements vertically in line with said first holder, a test speciment being engageable with said holders;

means for displacing said intermediate element along said rods between said elements for stressing the sample between said holders, said first sample holder being provided with a laterally extending annular flange matingly engageable with the selected seats, said first holder having on one side of said flange a connection pin and on the other side of said flange a connection sleeve.

3,859,849

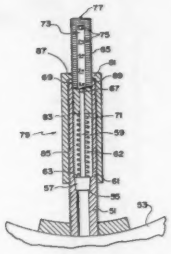
VALVE STEM PRESSURE INDICATOR

Greg A. Novak, P.O. Box 511, Oakland, Calif. 94604

Division of Ser. No. 135,330, April 19, 1971, Pat. No. 3,739,637. This application Mar. 21, 1973, Ser. No. 343,343

Int. Cl. B60c *23/04*

U.S. Cl. 73—146.8 **4 Claims**



1. A pneumatic pressure indicator comprising

a hollow valve stem having a passageway extending axially therethrough attached to a tire or the like,

a hollow, threaded shaft threadably mounted in one end of the passageway of said valve stem and having an axial passageway generally coaxial to said valve stem passageway, said threaded shaft being provided with turning flats on opposite sides thereof and a calibrated series of pressure indicating numbers formed along said flats which are alignable with an indicating means according to the pressure desired,

a valve seat formed in said passageway through said stem near the connection of said stem to said tire,

a piston valve reciprocally positioned in said stem passageway and capable of seating against said valve seat, and an elongated hollow stem fixed to said piston valve to provide a passage therethrough and extending outwardly into said passageway formed in said threaded shaft whereby air can be passed into the tire through said piston valve, such as by placing a pressurized air hose over a spring biased air inlet valve mounted in the upper end of said shaft passageway,

at least one spring mounted over said stem and held between the lower end of said threaded shaft and said valve portion, the compression of said spring being adjustable for biasing said piston valve against said valve seat by the rotation of said shaft within said passageway of said stem, and

a whistle aperture formed in the side of said valve stem above said valve seat whereby air is released through said aperture producing an audible sound when said piston valve is moved upward against the biasing of said spring at a preselected pressure level in a tire or the like.

3,859,850

METHODS AND APPARATUS FOR TESTING EARTH FORMATIONS

Frank R. Whitten, Houston, and Joachim A. Hoppe, Spring, both of Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Mar. 20, 1973, Ser. No. 343,081

Int. Cl. E21b *49/00*

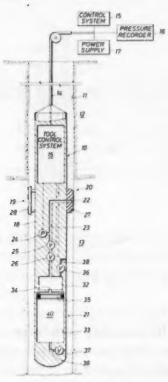
U.S. Cl. 73—155 **16 Claims**

1. A method for investigating earth formations t aversed by a well bore and comprising the steps of:

isolating a wall surface of said well bore adjacent to an earth formation believed to contain producible connate fluids from well bore fluids;

communicating a first empty sample chamber with said isolated wall surface for inducting a preliminary sample of connate fluids from said earth formation into said first sample chamber;

blocking the discharge of said preliminary connate fluid sample into a second empty sample chamber until said first sample chamber is filled with said preliminary connate fluid sample and the pressure thereof has increased to a predetermined pressure level;



monitoring the pressure of said preliminary connate fluid sample for obtaining a first pressure measurement indicative of said predetermined pressure level to determine when said first sample chamber is filled; and

once said first sample chamber is filled with said preliminary connate fluid sample, opening communication between said sample chambers for collecting said preliminary connate fluid sample as well as an additional sample of said connate fluids.

3,859,851

METHODS AND APPARATUS FOR TESTING EARTH FORMATIONS

Harold J. Urbanosky, Pearland, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 12, 1973, Ser. No. 424,122

Int. Cl. E21b *47/06*

U.S. Cl. 73—155 **34 Claims**

1. A method for investigating earth formations traversed by a well bore and comprising the steps of:

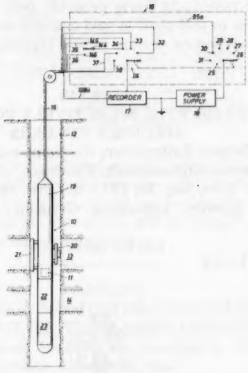
isolating a wall surface of said well bore adjacent to an earth formation believed to contain producible connate fluids from well bore fluids;

communicating a first expansible sample chamber with said isolated wall surface and expanding said first sample chamber at a first predetermined rate of expansion for inducting a first sample of said connate fluids from said earth formation at a first maximum-possible flow rate into said first sample chamber;

monitoring the pressure of said first fluid sample as it is being inducted for obtaining a first pressure measurement which is indicative of the actual flow rate of said first fluid sample;

communicating a second expansible sample chamber with said isolated wall surface and expanding said second sample chamber at a second predetermined rate of expansion different than said first predetermined expansion rate for inducting a second sample of said connate fluids from said earth formation at a second maximum-possible flow rate into said second sample chamber;

monitoring the pressure of said second fluid sample as it is being inducted for obtaining a second pressure measurement which is indicative of the actual flow rate of said second fluid sample; and, thereafter,



correlating said first and second pressure measurements for estimating the relationship of said actual flow rates to said maximum-possible flow rates.

3,859,852

FLUID FLOW MEASURING DEVICE

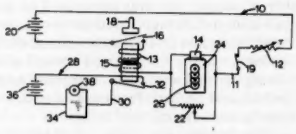
Biljana Bicky Milin, and Ivan Milin, both of 149 Pacific Ave., Toronto 9, Ontario, Canada

Continuation-in-part of Ser. No. 347,672, April 4, 1973,. This application May 29, 1973, Ser. No. 364,916

Claims priority, application Great Britain, Apr. 18, 1972, 17833/72; Canada, Apr. 2, 1973, 167720

Int. Cl. G01f *1/00*; G01p *5/10*

U.S. Cl. 73—204 **19 Claims**



1. A method of measuring the volume rate of gaseous fluid flow in a given cross-section of a duct, comprising the steps of:

connecting a varistor in series with an electrical power source;

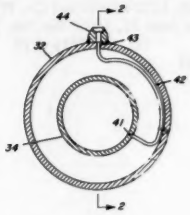
moving the varistor a predetermined distance and at a predetermined velocity transversely through the given cross-section of the duct in a linear path; and

measuring the total amount of the electric current during the travel of the varistor.

3,859,853
PRESSURE TAP CONNECTION

Kamel A. Khuzaie, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Continuation of Ser. No. 199,430, Nov. 17, 1971, abandoned.
This application June 15, 1973, Ser. No. 370,427
Int. Cl. F15d 1/02; G01f 1/00
U.S. Cl. 73—213 1 Claim



1. In a steam supply system including a pressure vessel containing a supply of pressurized steam, a steam utilization device, and a steam pipe for conducting pressurized steam from said pressure vessel to said utilization device, a venturi arrangement for measuring the steam flow rate through said steam pipe comprising: a venturi member in said pipe including a converging inlet section having an outside diameter at its input end to provide an installation clearance relative to the inside diameter of said pipe, a throat section having reduced inside and outside diameters relative to the inside diameter of said pipe whereby a space is provided between said throat section and said pipe, and a diverging diffuser section welded at its inlet end to the outlet end of said throat section and welded at its outlet end to said pipe to secure said venturi member in said pipe; a first pressure tap in the wall of said throat section of said venturi member; a pressure take-off aperture in the wall of said pipe adjacent said throat section; a pressure tube located in said space between said throat section and said pipe, said pressure tube being welded at one end to said throat section in communication with said first pressure tap and welded at its other end to said wall of said pipe in communication with said aperture, at least a portion of said pressure tube being positioned substantially circumferentially within said space and at least partly encircling said throat section of said venturi member; a second pressure tap located in the wall of said pipe and spaced along said pipe from said venturi member; and means communicating with said aperture and with said second pressure tap for sensing the difference in pressures at said first and second pressure taps.

3,859,854
APPARATUS FOR MEASURING A LIQUID DISCHARGE

John F. Dye; William J. Binard, both of Barrington, and Leonard R. Anglada, Arlington Heights, all of Ill., assignors to The Kendall Company, Walpole, Mass.

Filed May 14, 1973, Ser. No. 360,218
Int. Cl. G01f 1/00
U.S. Cl. 73—215 36 Claims

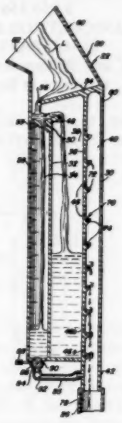
1. Apparatus for measuring a discharge of liquid, comprising:

a hollow receptacle having an inlet port adjacent the upper end of the receptacle to receive the liquid discharge, said receptacle including,

a cup-shaped pan below the inlet port to receive the liquid, said pan having a bore extending through the pan at a lower portion thereof, and an upper edge to direct overflow from the pan into a lower part of the receptacle,

a chamber below said pan and communicating with the pan bore to collect liquid from the pan passing through the bore and measure the period of time of the liquid discharge,

an upright wall in the receptacle at least partially defining the sides of a compartment below the pan edge to receive liquid overflowing from the pan and a channel adjacent said compartment, said wall having opening means communicating between said compartment and channel to permit passage of liquid from the compartment to the channel as the liquid collects in said compartment,



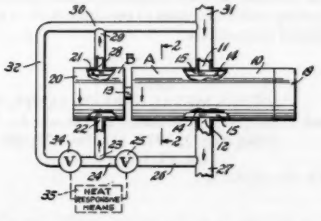
means for draining liquid from said channel, and

means for indicating the approximate maximum height of liquid collected in the compartment during the discharge to determine the approximate peak flow rate of the liquid discharge.

3,859,855
TEMPERATURE COMPENSATED ROTARY GAS METER

Theodore A. St. Clair, Fairfield, Conn., assignor to Textron Inc., Providence, R.I.

Filed July 12, 1973, Ser. No. 378,780The portion of the term of this patent subsequent to Jan. 1, 1991, has been disclaimed.
Int. Cl. G01f 3/08
U.S. Cl. 73—254 4 Claims



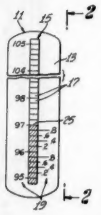
1. A rotary gas meter comprising inlet means, outlet means, primary rotor means having a capacity to meter a predetermined volume of gas flowing through the meter from the inlet means to the outlet means, at a determinate maximum absolute temperature, a secondary rotor means, means connecting said primary rotor means to said secondary rotor means for synchronous rotation, means connecting said secondary rotor means to said inlet means and said outlet means, said secondary rotor means having the capacity to flow a quantity of gas which is equal to the difference in said predetermined volume of the gas at said maximum absolute temperature and the volume of the same gas at said minimum absolute temperature, temperature responsive means responsive to the absolute

temperature of the gas flowing through the meter including valve means for controlling the output of said secondary rotor means as a function of the difference in absolute temperature between said predetermined maximum absolute temperature and then existing absolute temperature of the gas flowing through the meter; and indexing means connected to and responsive to the operation of said rotor means.

3,859,856
APPARATUS AND METHOD FOR MEASURING A TEMPERATURE

Susan Steves Keele, and William Keith Ross Watson, both of San Diego, Calif., assignors to Kay Laboratories, Inc., San Diego, Calif.

Filed Feb. 16, 1973, Ser. No. 333,140
Int. Cl. G01k *11/12, 11/06*
U.S. Cl. 73—356 **32 Claims**



1. A thermometer for measuring the temperature of an environment, including:

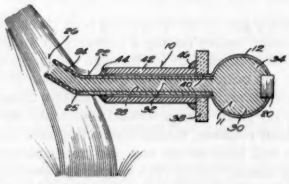
a backing member;

first means supported by the backing member at a plurality of discrete positions and having, at each of the discrete positions, individual properties responsive to heat in the environment for changing state at a different known temperature to provide a visual indication of the temperature of the environment in accordance with the number of discrete positions changing state, the first means having at each discrete position characteristics for changing from a solid to a liquid at the different known temperature and for thereafter continuing in the liquid state at temperatures below the different known temperature and further having characteristics of being converted to the solid form at particular temperatures considerably below the different known temperature and of thereafter becoming converted again to the liquid form at the different known temperature.

3,859,857
MOLTEN METAL STREAM SAMPLER

Richard A. Falk, 519 Westminster Dr., Waukesha, Wis. 53186

Filed Aug. 2, 1972, Ser. No. 277,182
Int. Cl. G01n *1/20*
U.S. Cl. 73—425.4 R **3 Claims**

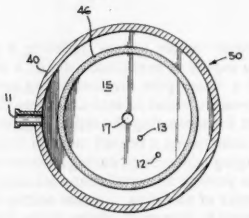


1. A sampler for taking a metal sample from a stream of molten metal comprising wall means defining a sample cavity, a sample pick-up tube with a tip adapted to be inserted in the stream of metal and having a passage in communication with said cavity and wherein said pickup comprises a refractory tube with a uniform longitudinal axis having a beveled end, said beveled end being in a plane which intersects said axis.

3,859,858
SURFACE ANGLE-OF-ATTACK DETECTOR

Arthur J. Ostdiek, 12224 Dalewood Dr., Wheaton, Md. 20902

Filed June 21, 1973, Ser. No. 372,138
Int. Cl. G01p *3/26*
U.S. Cl. 73—505 **6 Claims**



1. In a fluid vortex device comprising a substantially cylindrical sidewall; a pair of substantially flat circular endwalls forming a base and a cover, respectively; said sidewall and endwalls defining a chamber; annular diffusion means within said chamber dividing same into an inner vortex chamber and an outer annular chamber; means for introducing fluid into said outer annular chamber through said sidewall, whereby said fluid will flow through said diffusion means into said vortex chamber; and axial fluid drain outlet means disposed in said base; the improvement comprising a pair of spaced apart orifices located in said base, said orifices lying on a vector which does not pass through the center of said drain, the outermost of said pair of orifices defining means for bleeding fluid from said chamber to thereby establish a pressure distribution across the innermost of said pair of orifices, and means for detecting the pressure distribution across said innermost orifice.

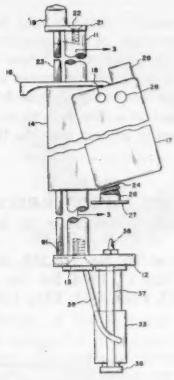
3,859,859
SPRING SYRINGE DRIVE APPARATUS

Michael E. Stickney, Burlingame, Calif., assignor to Durrum Instrument Corporation, Palo Alto, Calif.

Filed June 1, 1973, Ser. No. 365,969
Int. Cl. G05g *17/00;* **A61m** *5/20;* **G01f** *11/06*
U.S. Cl. 74—2 **9 Claims**

1. A spring drive apparatus including a driving member, a spring engaging said driving member urging said driving member for movement in a predetermined direction, means for compressing said spring, means for controlling distance of movement of said driving member, and trigger means causing said spring to act upon said driving member to move it over said distance, wherein said means for compressing said spring moves said means for controlling distance of movement wi-

thou moving said driving member, whereby said driving member moves serially through said distance from a new reference



each time said means for compressing said spring and said trigger means are actuated.

3,859,860

DEVICE FOR RECORDING THE SPEED AND/OR THE COVERED DISTANCE OF A VEHICLE

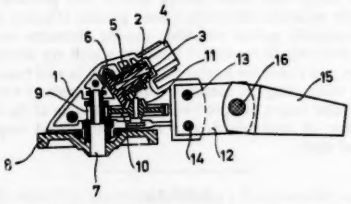
Antonius Cornelis Koot, Utrecht, Netherlands, assignor to Industrie Koot B.V. Industrieterrein "De Hooge Waard", Montfoort, Netherlands

Filed June 25, 1973, Ser. No. 373,298

Claims priority, application Netherlands, June 27, 1972, 7208869

Int. Cl. F16h *37/00*

U.S. Cl. 74—12 **3 Claims**



1. A speedometer device for transmitting to a meter or a recorder the speed of and/or the distance traveled by a vehicle, such as a bicycle, an autobike or the like, said device comprising:

a casing;

an input shaft extending into said casing and having fixed to the outer end thereof driving wheel means for frictionally contacting a tire of said vehicle;

an output shaft extending into said casing and having means for connection to the female thread of a bowden-cable;

means for mounting said casing to said vehicle with said driving wheel means in frictional contact with a tire thereof; and

transmission gearing means positioned completely within said casing for transmitting rotation of said input shaft to said output shaft and thus to a bowden-cable attachable thereto.

3,859,861

DEVICE FOR TRANSFORMING ROTARY MOTION INTO OSCILLATORY MOTION

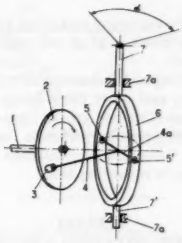
Marcus B. Buschi, Frick, Switzerland, assignor to Jakob Mueller, Frick (Aargau), Switzerland

Filed Mar. 1, 1973, Ser. No. 337,216

Claims priority, application Switzerland, Mar. 2, 1972, 3038/72

Int. Cl. F16h *21/18*

U.S. Cl. 74—42 **8 Claims**



1. A device for transforming rotary motion into oscillatory motion, comprising input means mounted for rotation about an input axis, and including an input shaft, wobble means fixedly secured to said input shaft in a slanted position and input joint means eccentric to said input shaft and comprising two input joint halves diametrically disposed on said wobble means; and output means mounted for angular movement about a single output axis transverse to said input axis, and including an output shaft, frame means fixedly secured to said output shaft and surrounding said slanted wobble means, and output joint means eccentric to said output shaft and comprising two joint halves diametrically disposed on said frame means and respectively connected with a correlated input joint shaft so that rotation of said input means causes oscillatory angular motion of said output means about said single output axis at a cyclically varying speed.

3,859,862

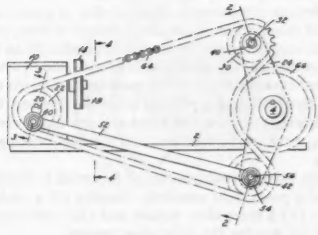
CYCLICLY REPETITIVE MOTION GENERATING SYSTEM

John Henry Brems, 32867 White Oaks Trl., Birmingham, Mich. 48010

Filed Nov. 2, 1973, Ser. No. 412,469

Int. Cl. F16h *27/04*

U.S. Cl. 74—82 **20 Claims**



1. A multiple step reversible intermittent motion mechanism comprising:

a. a frame,

b. a first drive member rotatably mounted on said frame to rotate on a first axis,

c. a second drive member rotatably mounted on said frame to rotate about a second axis spaced from said first axis,

d. an oscillating member pivotally mounted about the axis of one of said drive members,

e. multiple idler means mounted on said oscillating member,

f. a continuous loop of flexible drive means in tangential driving engagement with said first and second drive members and in engagement with said idler means having a path such that one of said drive members is external to the topological loop of said flexible drive means and said idler means and said other drive member is internal to said topological loop,

g. a drive link,

h. means pivotally mounting said drive link at one point to said first drive member at an axis spaced from said first axis, and

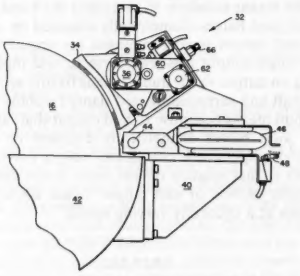
i. means connecting said link at another point to said oscillating member, said other point being spaced from said first point on said link and spaced from the mounting axis of said oscillating member, wherein rotation of said first drive member will cause an oscillation of said oscillating member about its mounting axis.

3,859,863

ASSEMBLY FOR ROTATING A FLYWHEEL, FOR SHORT, INCREMENTAL DISTANCES

Mason M. Howlett, Penfield, N.Y., assignor to The Gleason Works, Rochester, N.Y.

Filed Aug. 13, 1973, Ser. No. 387,888
Int. Cl. F16h *27/02*
U.S. Cl. 74—142 **1 Claim**



1. In a press of the type which includes (a) a flywheel operatively connected to a main drive motor for being driven thereby, (b) a clutch device for engaging and disengaging said flywheel with driving structures operatively connected with a ram portion of the press, (c) a flywheel braking means for braking or locking the flywheel while the flywheel is engaged with said driving structures to thereby stop or prevent movement of said ram portion when said flywheel braking means is brought into engagement with the flywheel, and (d) an inching drive mechanism operatively associated with said flywheel and said flywheel braking means for imparting increments of rotation to the flywheel during periods when the flywheel braking means is disengaged from the flywheel, the improvement in said inching drive mechanism and said flywheel braking means comprising

a movable assembly which can be mounted to fixed structure of a press, said assembly carrying (i) a brake shoe means, (ii) a drive shoe means, and (iii) a driving motor means for moving the drive shoe means,

actuating means for moving said assembly between positions which place the brake shoe means in and out of frictional contact with flywheel of said press,

eccentric means for mounting said brake shoe means and said drive shoe menas relative to each other to provide for alternating engagement of the brake shoe means and the drive shoe means with said flywheel so that the flywheel is blocked from free rotation between successive engagements of the drive shoe means therewith, said drive shoe means being operatively connected to said driving motor means through said eccentric means so that only the drive shoe means is driven by direct action of the driving motor means, and

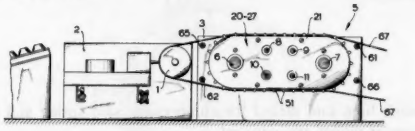
resilient means mounted between said movable assembly and said fixed structure of the press for allowing limited movement of the brake shoe means away from said flywheel when said drive shoe means is moved into engagement with the flywheel and while the movable assembly is being urged in a direction to normally place the brake shoe means in contact with the flywheel.

3,859,864

FEEDING DEVICE FOR TAPE-TYPE RECORD CARRIERS

Karl-Heinz Offermann, Gartenstrasse 10, Sprockhovel, Germany (4322)

Continuation-in-part of Ser. No. 376,289, July 5, 1973. This application May 17, 1974, Ser. No. 471,135
Int. Cl. F16h *7/02*; **F16g** *1/28*
U.S. Cl. 74—229 **15 Claims**



1. In a feeding device for tape-type record carriers, perforated at their lateral edges, of the type having spiked rotatable driving elements, arranged in pairs, with the driving elements of each pair having a lateral spacing equal to that of carrier perforations, in a frame having a width preferably at least equal to that of the printing mechanism of a bookkeeping machine, data processing machine and the like, and which feeding device has a driving means driven by a profiled shaft and mounted in a housing which is displaceable axially along axles of the frame and which has at least one liftable record carrier guide bar: the improvement comprising, in combination, a single said frame having several said profiled shafts rotatably mounted therein in spaced parallel relation; respective externally spiked rotatable driving elements mounted freely rotatably in respective housings which are arranged in pairs in said frame for lateral displacement in said frame; and means connecting the rotatable driving elements of each pair to the same respective profiled shaft for driving of the associated pair of rotatable driving elements by said respective profiled shaft.

3,859,865

POSITIVE CENTERING ROLLERS OR PULLEYS FOR WOVEN WIRE BELTING CONVEYERS

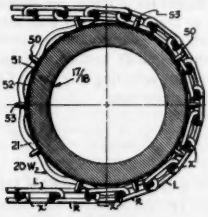
Rene Conrad, 700 Catamaran, San Mateo, Calif. 94404

Filed Apr. 30, 1973, Ser. No. 355,867
Int. Cl. F16h *7/18*, *55/36*
U.S. Cl. 74—241 **15 Claims**

1. A woven wire belting conveyer roller for use with belting of the type having alternately left and righthand spiralled coils of wire flattened and forming links between cross rod hinges gauged to form a balanced spiral mesh in which net opening voids between convolutes of the flattened spiralled coil links face the roller, the combination therewith of means for positively centering such belting relative to the rollers comprising: a cylindrical roller; and

oppositely tending spiralled ribbing coiled about said cylindrical roller from widthwise center toward the ends thereof and coordinated with the size and pitch of the spiralled coils of the flattened spiralled coiled wire links of such balanced spiral mesh for projecting into the net opening voids thereof to prevent sidewise slippage of such

woven wire belting relative to said cylindrical roller, said spiralled ribbing having a portion of its belt engaging periphery serrated to provide outwardly projecting portions in coordination with the gauge of the spacing of the



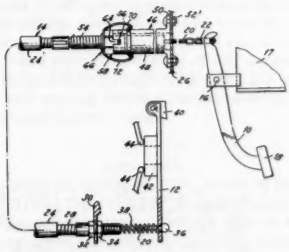
cross rod hinges of the balanced spiral mesh of such woven wire belting for projecting into the net opening voids between convolutes of alternate ones of the flattened spiralled coiled links thereof.

3,859,866

CLUTCH ACTUATING MECHANISM

Victor S. De Grazia, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 5, 1973, Ser. No. 413,160
Int. Cl. G05g *1/14*
U.S. Cl. 74—512 **7 Claims**



1. An actuating mechanism having a first movable member, a second movable member and connecting means operatively interconnecting said first and second movable members;

support means supporting said connecting means;

a stationary support structure;

adjustment means constructed to connect said support means to said support structure;

said adjustment means including an adjustment element connected to said support means;

said adjustment element having an axially extending gauge portion;

said support structure having a gauge receiving portion;

said adjustment element being displaceable from a first position wherein said gauge portion engages said support structure and is spaced apart from said gauge receiving portion to a second position wherein said gauge portion is seated in said gauge receiving portion;

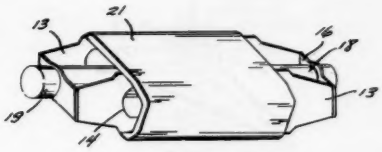
retaining means constructed to hold said adjustment element in engagement with said support structure when said gauge portion is seated in said gauge receiving portion.

3,859,867

BICYCLE PEDAL ATTACHMENT

Virginia E. Haines, 6103 Harwood, Des Moines, Iowa 30312, and William F. Albright, 1616 Bell Ave., S.W., Des Moines, Iowa 40315

Filed Feb. 26, 1973, Ser. No. 335,921
Int. Cl. G05g *1/16*
U.S. Cl. 74—563 **4 Claims**



1. A bicycle pedal device comprising:

a bicycle pedal having a central member adapted to be affixed to a pedal crank, said pedal having elongated, transversely opposed, parallel side walls affixed to and on opposite sides of the central member, the outer exposed edges of said side walls having serrations thereon;

sleeve means formed by a continuous wall of flexible material for surrounding said pedal in an unstretched condition of said sleeve means;

means for holding said sleeve means on said pedal comprising frictional abutment of portions of an inner part of said flexible wall of said sleeve means in contact with said serrations of said pedal side walls; and

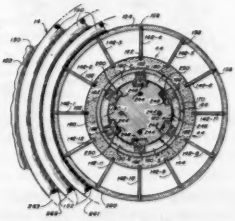
means for preventing said sleeve means from rotating on said pedal wherein said sleeve means is of substantially a parallelogram shape with rounded corners, as viewed from an end view of an open end of said sleeve means.

3,859,868

INERTIAL ENERGY STORAGE APPARATUS

Stephen F. Post, Walnut Creek, Calif., assignor to Post Group, Walnut Creek, Calif.

Continuation-in-part of Ser. No. 372,346, June 21, 1973, abandoned, Division of Ser. No. 68,959, Sept. 2, 1970, Pat. No. 3,741,034. This application July 19, 1973, Ser. No. 380,563
Int. Cl. F16f *15/30*
U.S. Cl. 74—572 **35 Claims**



1. An inertial energy storage rotor comprising centrifugal loading means incorporated in each one of a plurality of portions of the rotor, each of said portions being bounded by a pair of cylinders which are coaxial with the rotor, and the elasticity-density ratios of said portions increasing with mean radius.

3,859,869

RATCHET MECHANISM

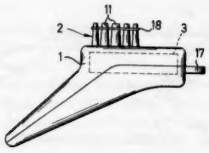
Max Pasbrig, Orselina, Switzerland, assignor to Lacrex Brevetti S.A., Via Motta, Switzerland

Filed Sept. 20, 1973, Ser. No. 399,242

Claims priority, application Switzerland, Oct. 11, 1972, 14891/72

Int. Cl. G05g *1/00*

U.S. Cl. 74—575 **7 Claims**



1. A ratchet mechanism for use in connection with a variety of hand tools such as screwdrivers, box-spanners and similarly operable hand-tools having a substantially rod-shaped, columnar or elongated handle mounted on the tool-shank, the mechanism comprising a base, a ratchet wheel rotatably secured to said base, a plurality of oscillatable pawls in operative engagement with said ratchet wheel, a shift-lever for actuating said pawls into operative engagement with said ratchet wheel, driver means substantially co-axial with the rotational axis of said ratchet wheel adapted to be mounted on or slipped over the end of a tool handle whereby reversible rotation can be readily imparted to said tool handle during use.

3,859,870

VARIABLE-SPEED AND REVERSE GEARBOXES

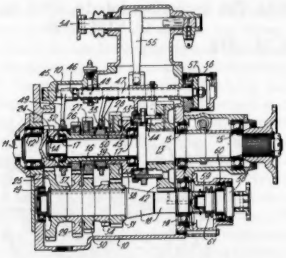
Eric Albert Whateley, Huddersfield, England, assignor to David Brown, Gear Industries Limited, Meltham, Huddersfield, England

Filed Sept. 18, 1972, Ser. No. 290,155

Claims priority, application Great Britain, Oct. 16, 1971, 48233/71; May 4, 1972, 20732/72

Int. Cl. F16h *3/08*

U.S. Cl. 74—745 **14 Claims**



1. A variable-speed and reverse gearbox comprising an input shaft, an intermediate shaft co-axial with the input shaft, an output shaft co-axial with the intermediate shaft, a layshaft parallel to the aforementioned shafts, a counter-shaft parallel to the layshaft, a gear fixed on the input shaft meshing constantly with a gear fixed on the layshaft, at least one gear rotatably mounted on the intermediate shaft meshing constantly with a gear fixed on the layshaft, clutch means for drivably connecting the input shaft directly to the intermediate shaft and, alternatively, for drivably connecting the gear rotatably mounted on the intermediate shaft to said intermediate shaft, a reverse gear fixed on the layshaft meshing constantly with another reverse gear rotatably mounted on the countershaft, clutch means for drivably connecting the last-mentioned gear to the countershaft, a gear fixed on the intermediate shaft meshing constantly with a gear fixed on the countershaft, a gear rotatably mounted on the output shaft meshing constantly with another gear fixed on the countershaft, clutch means for drivably connecting the intermediate shaft directly to the output shaft and, alternatively, for drivably connecting the gear rotatably mounted on the output shaft to said output shaft, and control means for said clutch means operable for selecting any one of the available power paths through the gearbox.

3,859,871

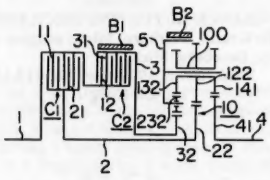
SPEED CHANGE GEAR DEVICE

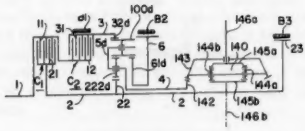
Sumio Uozumi, Toyota, and Koichiro Hirosawa, Kariya, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi-ken, Japan

Division of Ser. No. 42,661, June 2, 1970, Pat. No. 3,733,928. This application Mar. 9, 1973, Ser. No. 339,841

Int. Cl. F16h *57/10*

U.S. Cl. 74—761 **4 Claims**



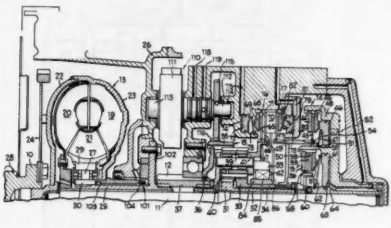


1. A speed change gear device consisting essentially of a first and a second clutch means provided between an input and an output shaft disposed concentrically within a gear case, and a planetary gear train having a first and a second input gear member connected, respectively, to said first and second clutch means, an output gear member connected to said output shaft, and a first and second brake means for holding said first and second input gear members, respectively, whereby a combination of speed change ratios of required steps is obtained at the output shaft by selective action of said clutch and brake means, the planetary gear train comprising two sun gears each of which is independently rotatable, a short pinion gear in engagement with one of the sun gears, a long pinion gear in engagement with the short pinion gear and with the other sun gear, a ring gear engaged with the long pinion gear, and a carrier rotatably supporting said short and long pinion gears.

3,859,872
AUTOMOTIVE TRANSMISSION

Julius A. Clauss, Jr., Birmingham, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 852,630, Aug. 25, 1969, abandoned.
This application Jan. 29, 1973, Ser. No. 327,372
Int. Cl. F16h *57/10*
U.S. Cl. 74—763 **2 Claims**



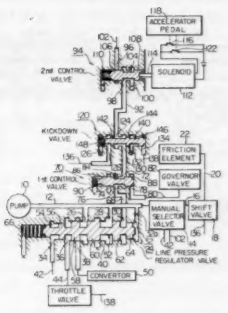
1. In an automotive transmission, a housing, a drive shaft; an input shaft; a hydraulic torque converter in said housing having an impeller connected to and driven by said drive shaft, and a turbine splined to one end of said input shaft; planetary gearing in said housing mounted at the opposite end of said input shaft; said gearing having an output element driven by said gearing; an output gear rotatable on said input shaft connected to said output element to be driven thereby and mounted in a space provided in said housing located between said hydraulic torque converter and said gearing; a governor shaft journaled in said housing parallel to said input shaft and extending through said space; a drive gear drivingly connected to said governor shaft and connected to be driven by said output element of said gearing; said governor shaft and drive gear located radially outwardly of said planetary gearing; a hydraulic governor assembly mounted on said governor shaft in said space and radially outwardly of said output gear and connected to be driven by said drive gear; and said output element of said gearing having external teeth to drive said drive gear on said governor shaft.

3,859,873
LINE PRESSURE MODULATING DEVICE FOR AN AUTOMATIC POWER TRANSMISSION

Toshiyuki Miyauchi, and Kunio Ohtsuka, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Aug. 23, 1973, Ser. No. 390,853
Claims priority, application Japan, Aug. 24, 1972, 47-84047
Int. Cl. B60k *17/10;* **C05g** *19/00*
U.S. Cl. 74—867 **6 Claims**

1. A line pressure modulating device for a hydraulic control system of an automatic power transmission of a motor vehicle having an accelerator pedal, the hydraulic control system having a manual selector valve communicating with a source of line pressure, a throttle valve transmitting a throttle pressure representative of the output torque of a vehicle engine, and a governor valve transmitting a governor pressure varying in dependence on the rotational speed of an output shaft of the automatic power transmission, said device comprising, in combination, a line pressure regulator valve communicating with said source of line pressure and responsive to said throttle pressure from said throttle valve for regulating the line pressure in dependence thereon, a first control valve communicating with said line pressure regulator valve and responsive to said governor pressure from said governor valve, a second control valve communicating with said first control valve and said manual selector valve to receive from said manual selector valve line pressure, an electric actuating means to actuate said second control valve, and a first switch electrically connected to said electric actuating means, said first switch being mechanically linked with said accelerator pedal to close when said accelerator pedal is released, said electric actuating means being energized when said first switch is closed for actuating said second control valve to cause the same to transmit line pressure from said manual selector valve to said first control valve, and said first control valve being movable to a

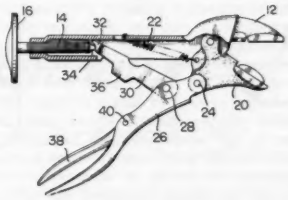


position to transmit line pressure applied thereto to said line pressure regulator valve when said governor pressure is below a first predetermined level, whereby said line pressure regulator valve is movable to a position to decrease the level of line pressure when said accelerator pedal is released while the motor vehicle is at a standstill.

3,859,874
PLIER TYPE TOOL

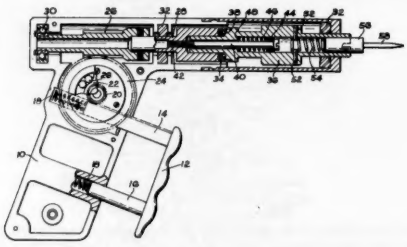
Stanley V. Joeckel, 549 Terhune Dr., Wayne, N.J. 07470

Filed Mar. 15, 1973, Ser. No. 341,504
Int. Cl. B25b *7/12, 7/02*
U.S. Cl. 81—367 **10 Claims**



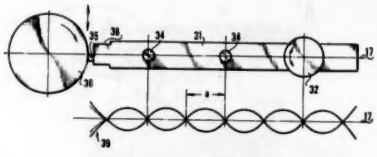
1. A locking type plier tool having a first and second jaw element in opposed relation with free forward ends and pivotally interconnected near the rear ends, a pair of handle members operatively connected to said jaw elements for movement of the jaw elements in closing direction toward each other and in opening direction away from each other, means for adjusting the spacing between the jaw elements in closed position thereof, means for locking the jaw elements in closed position, said first jaw element having a longitudinal first groove on the side facing said second jaw element, said second jaw element provided with an elongated arcuate shaped protuberant portion having lateral flanks adapted to be receivable inside the first groove, and said protuberant portion having a longitudinal second groove for cooperating with the first groove whereby a workpiece of different configurations can be clamped thereby.

3,859,875
HAND OPERATED TOOLS
Zdzislaw Bieganski, Apem Works, St. Albans Rd., Watford, England
Filed Jan. 21, 1974, Ser. No. 434,909
Claims priority, application Great Britain, Jan. 19, 1973, 2827/73
Int. Cl. B25b
U.S. Cl. 81—52.4 R 8 Claims



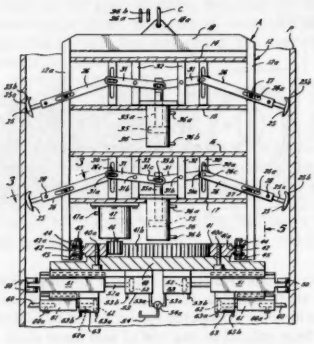
1. A hand-operated tool comprising a butt having a rack and pinion mechanism with the rack displaceable against a return spring by a trigger, and the pinion connected by a one-way clutch to a worm and pinion providing a uni-directionally rotatable final drive shaft, said shaft being connected via an adjustable torque clutch to one part of a releasable coupling, and at least one tool bit provided with a second part of said coupling for interchangeable connection therewith.

3,859,876
CUTTING DEVICE FOR AN ULTRASONIC VIBRATION SYSTEM
Masami Shimizu, and Akio Jindai, both of Tokyo, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan
Filed June 20, 1973, Ser. No. 371,855
Claims priority, application Japan, June 23, 1972, 47-62929
Int. Cl. B23b *29/04*
U.S. Cl. 82—36 R 3 Claims



1. A cutting device in an ultrasonic vibration system comprising:
- an elongated tool body having a symmetry plane through the center of said body;
- means forming a cutting edge at a front end of said body substantially at said plane;
- means for mounting said body so that the natural transverse bending vibration mode of said body has nodal points lying in said plane whereby said plane coincides with the neutral plane of vibration of said body;
- a torsional transducer operatively coupled to said body with its axis of torsional vibration lying in said plane and transverse to the longitudinal extension of said body at one of said nodal points; and
- an amplifier horn interposed between said body and said transducer to transmit bending vibration from said transducer to said body.

3,859,877
INSIDE PIPE CUTTER APPARATUS
C. Richard Sherer, and Russell M. Foyle, both of Houston, Tex., assignors to DND Corporation, Houston, Tex.
Filed June 23, 1972, Ser. No. 265,656
Int. Cl. B23b *5/14*
U.S. Cl. 82—82 9 Claims

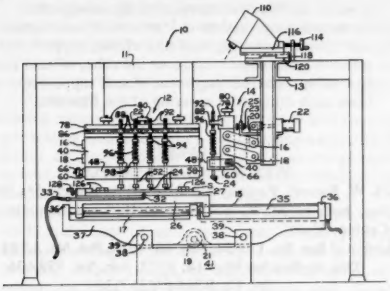


1. Pipe cutter apparatus for cutting pipe from the inside thereof and adapted to be operated remotely from the point at which the pipe is cut, comprising:
- a frame assembly having means therewith for lowering same into the inside of a pipe;
- wall anchoring means mounted on said frame assembly at longitudinally spaced apart locations for engaging the inside wall of the pipe to be cut;
- anchor actuating means mounted on said frame and operably connected with said wall anchoring means for moving said anchoring means from a retracted position out of contact with the inside wall of the pipe to an anchoring position in engagement with the inside wall of the pipe;
- a rotatable cutting head mounted on said frame assembly for rotation relative thereto;
- gauge means mounted on said cutting head for engaging the inside wall of the pipe at at least two circumferentially spaced points for substantially centering the cutting assembly in the pipe; and
- cutter means mounted on at least one of said gauge means for movement towards the inside wall of the pipe and relative to said gauge means after said gauge means engages the wall of the pipe for cutting through the wall of the pipe upon a rotation of said cutting head and said gauge means and said cutter means therewith.

3,859,878
APPARATUS FOR GANGED SCORING OF GLASS
Robert M. Bonaddio, Monroeville, and Laverne O. Parkhill, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Aug. 22, 1973, Ser. No. 390,446
Int. Cl. B26d *3/08*; C03b *33/02*
U.S. Cl. 83—8 8 Claims

1. A glass scoring apparatus comprising:
- a table for receiving glass to be scored;
- a frame spanning a substantial width of said table and spaced from a surface of said table;
- a plurality of glass scoring tools extending from said frame so as to confront said surface of said table;
- means for adjustably biasing said frame toward said surface of said table;
- means on said frame associated with each of said scoring tools for adjustably biasing each individual scoring tool toward said surface of said table; and

means for impartng relative motion between said table and said frame parallel to said surface of said table so as to



effect a score in the glass received on said table by each scoring tool.

3,859,879

CUTTING APPARATUS

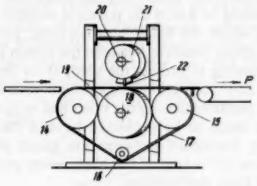
Ernst M. Spengler, Heusenstamm, Germany, assignor to Stanztechnik GmbH Roeder & Spengler, Bergen-Enkheim, Germany

Filed Mar. 5, 1973, Ser. No. 338,342

Claims priority, application Germany, Mar. 8, 1972, 2211118

Int. Cl. B26d *1/28*

U.S. Cl. 83—155 **3 Claims**



1. In an apparatus for cutting workpieces which advance in a given direction through the apparatus which has a frame structure, a cutting roller, means for supporting the cutting roller in said frame structure, counter pressure means, means for supporting the counter pressure means in said frame structure for cooperation with said cutting roller, strip steel knife means secured to said cutting roller to extend substantially radially away from said cutting roller, said cutting roller having an axis extending at an angle deviation from the normal to said advance direction and wherein said strip steel knife means are secured to said cutting roller so that the knife means follow a helix around the cutting roller, whereby said deviating angle is compensated to accomplish a scissor type cut, the improvement wherein said counter pressure means comprise an endless belt, guide roller means for said endless belt supported in said frame structure, said guide roller means having rotational axes extending in parallel to each other, a supporting roller located intermediate said guide roller means in said frame structure and under said endless belt in contact therewith, said supporting roller having an axis extending in parallel to said cutting roller axis and thus slanting at said angle deviation relative to said advance direction, said endless belt extending through a gap between said two rollers, said guide roller means extending at right angles to said advance direction, and at said angle deviation relative to the supporting roller and cutting roller axes, whereby the endless belt extends in said advance direction, said guide roller means being closely spaced from each other to leave just enough space for said supporting roller therebetween in its slanting position, said apparatus further comprising delivery conveyor means arranged downstream and immediately adjacent to said endless belt.

3,859,880

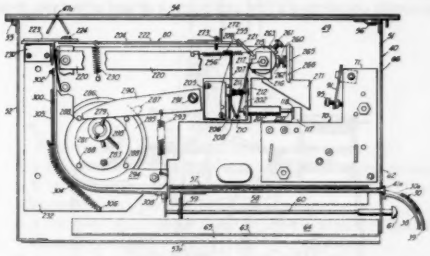
TICKET DISPENSING MACHINE

W. T. Schackelford, 149 Old Canton Rd., Marietta, Ga. 30060

Filed Jan. 26, 1973, Ser. No. 326,675

Int. Cl. G07b *5/02, 3/00*

U.S. Cl. 83—205 **10 Claims**



1. The ticket dispensing machine comprises:

a housing having a hollow interior;

a control assembly within the hollow portion of said housing, said control assembly including a plurality of juxtaposed levers for selectively being depressed to prescribed the designated numbers of tickets to be dispensed from a line of tandem connected tickets;

a dispensing assembly in said hollow portion of said housing; said dispensing assembly including a conveyor for said tickets and cyclic drive means for said conveyor, each cycle of said drive means causing said conveyor to advance said line of tickets by one ticket; and

means for severing said tickets after the designated number of tickets have been dispensed;

said dispensing assembly including switch means for controlling said drive means, said switch means being connected to and actuated by said control assembly;

said control assembly including a plurality of detent means each being selectively operable for locking said switch means in its actuated position and release means cooperating with all of said detent means and responsive to the cycline of said drive means for being incrementally moved in response to each cycle of said drive means, said release means having actuation means driven by said drive means for actuating respective of said release means, each actuator means being operative at a different and successive cycle to release its associated detent means after the designated number of tickets has been dispensed.

3,859,881

STOCK CUTTING APPARATUS

Sumner H. Hawley, Bay Village, and Albert Feucht, Parma, both of Ohio, assignors to Lewis Machine Company, a division of Wyle Laboratories, Cleveland, Ohio

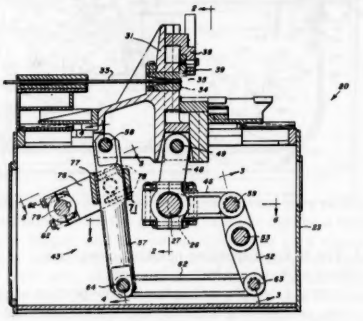
Filed Aug. 15, 1973, Ser. No. 388,603

Int. Cl. B23d *25/04*

U.S. Cl. 83—320 **8 Claims**

1. A wire cutoff assembly for cutting wire into predetermined lengths comprising, in combination, a base, a crankshaft having a crank arm, a cutoff slide head mounted in ways on said base for back and forth movement on a cutting and return stroke, a cutoff die mounted by said cutoff slide head and having a generally horizontally disposed opening for the reception of the wire, a knife holder slideably mounted by said cutoff slide head for movement in a generally vertical plane on

a downward cutting stroke and an upward return stroke, a knife carried by said knife holder, power linkage means interconnecting said crank arm to said slide head and said knife holder for moving the same through said respective movements, said linkage means including a connecting arm connected at one end to said crank arm, a knife drive arm connected at one end to said crank arm and at the other end to said knife holder, a drive lever, pivot means pivotally connecting said drive lever to said base, an adjustable drive lever, pivot means pivotally connecting said connecting arm at the other end to a first end portion of said drive lever, a drive link, pivot means pivotally connecting a second end portion of said drive lever to a first end portion of said drive link, pivot means pivotally connecting a first end portion of said adjustable drive



lever to said slide head, pivot means pivotally connecting a second end portion of said adjustable drive lever to a second end portion of said drive link, an adjustable pivot member connected to said adjustable drive member between said first and second end portions thereof, means for moving said adjustable pivot member relative to said first and second end portions of said adjustable drive member comprising an adjustment arm secured at one end portion to said adjustable pivot member, an adjustment shaft mounted by said base for rotation, said adjustment arm being secured at its other end to said adjustment shaft whereby rotation of said adjustment shaft causes movement of said adjustable pivot member on said adjustable drive member, and means for securing said adjustment shaft in a fixed rotational position.

3,859,882

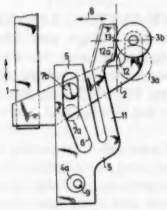
DEVICE FOR SEVERING FILAMENTARY MATERIAL UNDER A SQUEEZING FORCE

Hans Demuth, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed June 4, 1973, Ser. No. 366,524

Int. Cl. B23d *19/00*; **B26d** *1/20*

U.S. Cl. 83—482 **7 Claims**



1. A device for severing filamentary material comprising

a support defining a surface for abutting of a filament thereon;

a severing roller for rolling on said surface of said support to sever the filament thereon by squeezing; and

drive means connected to at least one of said support and said roller for moving said one of said support and said roller in translation relative to the other of said support and roller with disengagement of said support and roller from each other after severing of the filament.

3,859,883

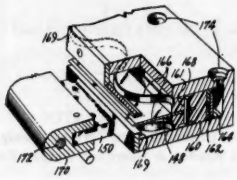
WEB SUPPLY APPARATUS

Kirk W. Bassett, Paxton, and Richard A. Butler, Jr., Brookline, both of Mass., assignors to Butler Automatic, Inc., Canton, Mass.

Division of Ser. No. 11,654, Feb. 16, 1970, Pat. No. 3,753,833. This application May 14, 1973, Ser. No. 359,636

Int. Cl. B26d *5/12, 7/22*

U.S. Cl. 83—545 **1 Claim**



1. A web cutting apparatus comprising an elongated blade, a piston coextensive with the blade upon which the blade is mounted, means for removably securing the blade to the piston, a housing in which the piston is slidable and from the open end of which the blade is projectable, means for introducing fluid under pressure between the piston and the closed end of the housing to project the blade from the open end of the housing and into cutting engagement with adjacent web, guard plates partially closing the open end of the housing, but allowing the blade to be projected beyond the guard plates and a spring interposed between the guard plates and the piston to cause retraction of the blade when pressurized fluid is exhausted from the housing.

3,859,884

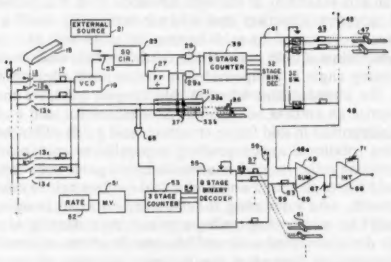
TONE GENERATOR

Dillon Ross Grable, 2414 Oakwood Ave., Huntsville, Ala. 35801

Continuation-in-part of Ser. No. 208,117, Dec. 15, 1971, abandoned. This application Feb. 20, 1973, Ser. No. 333,666

Int. Cl. G10h *1/00*

U.S. Cl. 84—1.01 **7 Claims**



1. A tone generator comprising:

frequency generating means for selectively generating a selected frequency and comprising:

actuating means for providing a selected electrical output,

oscillator means responsive to a said electrical output for generating a discrete frequency, and

squaring circuit means responsive to the output frequency of said oscillator means for shaping the output frequency of said oscillator means and providing pulse output cycles as the output of said frequency generating means;

counting means responsive to the output of said frequency generating means for repetively counting a selected total count of output cycles of said frequency generating means, each repeated composite count constituting an output cycle of said counting means;

decoding means responsive to said counting means and each said count of an output cycle of said generating means counted by said counting means for providing a selected output voltage for each discrete count of an output cycle of said generating means, said decoding means comprising:

a plurality of electrical circuits, each being adjustable and including means for providing a selected electrical output, and

switching means responsive to each of said discrete counts of said counting means for providing as an output of said decoding means an electrical output to one of said electrical circuits,

whereby a said output cycle of said decoding means repeats after each said selected total count, and the shape of said output cycle of said decoding means corresponds to the composite of said selected electrical outputs.

3,859,885

BUSHING STRUCTURE FOR USE IN PIANO ACTION

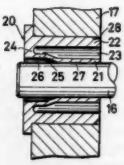
Hajime Hayashida, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed May 22, 1973, Ser. No. 362,711

Claims priority, application Japan, May 22, 1972, 47-50445

Int. Cl. G10c *3/18*

U.S. Cl. 84—251 **4 Claims**



1. A bushing for use in a piano comprising:

a relatively rigid outer ring;

a relatively flexible inner ring mounted coaxially with said outer ring and consisting of a larger diameter portion, a sloping portion, and a smaller diameter portion, said sloping portion connecting one end of said larger diameter portion to one end of said smaller diameter portion, said sloping portion forming an acute angle with the axis common to said inner and outer rings; and

a relatively rigid member connecting said outer ring to the other end of said larger diameter portion, said rigid member and said rings defining an annular space between said rings, whereby a pin smoothly fitted into said smaller diameter portion of said inner ring may be rotated therein and may undergo small radial and axial movement provided substantially exclusively by flexure of said sloping portion.

3,859,886

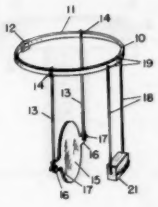
PERCUSSION MUSICAL INSTRUMENT

Joseph L. Brisco, Sr., 5437 Lynwood Ave., Baltimore, Md. 21215

Filed July 18, 1974, Ser. No. 489,727

Int. Cl. G10d *13/08*

U.S. Cl. 84—402 **2 Claims**



1. A percussion musical instrument comprising:

a. a body encircling flexible belt having a fastening means;

b. a first pair of flexible straps attached to said body encircling flexible belt by suitable means;

c. a resonant plate suspended from said first pair of flexible straps by suitable means;

d. a second pair of flexible straps attached to said body encircling flexible belt;

e. a striker block suspended on said second pair of flexible straps by suitable means; and

f. a finger enclosing flexible strap attached by suitable means to the outboard side of said striker block.

3,859,887

DRUMSTICK GRIPPING AID

Samuel R. Buchanan, 2480 S. University, Apt. No. 1, Denver, Colo. 80210

Filed Oct. 9, 1973, Ser. No. 404,487

Int. Cl. G10d *13/00*

U.S. Cl. 84—422 **12 Claims**

1. In a musical percussion instrument, a drumstick including a butt end, a striking end and an intermediate region therebetween, a balance area within the intermediate region, and a gripping member pivotally attached to said drumstick in the intermediate region adjacent to the balance area, said drumstick being freely pivotal with respect to said gripping member.

3,859,888

OVAL SCREW

Jujiro Okada, No. 69, Chodo-1-Chome, Higashi-Osaka City, Japan

Filed July 24, 1972, Ser. No. 274,211

Claims priority, application Japan, Feb. 28, 1972, 47-19703The portion of the term of this patent subsequent to May 1, 1990, has been disclaimed.

Int. Cl. F16b *23/00*

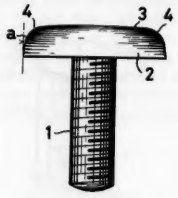
U.S. Cl. 85—45 **2 Claims**

1. A screw threaded fastening element, comprising:

a threaded shank portion;

a tool engaging head having coaxially arranged upper and lower surfaces and an inclined side portion connecting said upper and lower surfaces and adapted to engage a tool, said upper surface being smaller than said lower surface, said lower surface being flat and connected to said threaded shank portion at an end of said shank por-

tion, said upper surface having a circular cross section, said lower surface having an elliptical cross section having a major axis and a minor axis, said inclined side portion tapering upwardly from said elliptical lower surface to said circular upper surface and having a varying radius



of curvature, said radius of curvature being a minimum value at the intersection of said top surface and the plane of the major axis of said elliptical lower surface and increasing to a maximum valve at the intersection of said top surface and the plane of the minor axis of said elliptical lower surface.

3,859,889

MOUNTING DEVICE FOR SUSPENDED CEILINGS AND THE LIKE

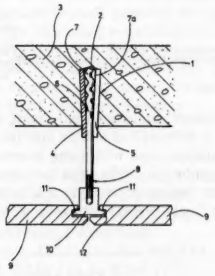
Artur Fischer, Altheimer Strasse 219, D-7241 Tumlingen, Germany

Filed June 15, 1973, Ser. No. 370,537

Claims priority, application Germany, July 11, 1972, 2233933

Int. Cl. F16b *13/04*

U.S. Cl. 85—79 **3 Claims**



1. A suspension arrangement, comprising an element to be suspended from a support structure; an elongated rod having an undulate first end portion and a second end portion, said first end portion being adapted for insertion into a hole of the support structure and having at two opposite sides respective waves, the transverse distance between the crests of waves at said opposite sides being increasingly greater in direction away from said second end portion; a longitudinally slotted expansion sleeve of substantially cylindrical shape having an inner diameter smaller than the greatest distance between two wave crests located at the respective opposite sides, so as to become expanded when forcibly advanced along said rod from said second end portion and into a hole in which said first end portion is located, whereby said sleeve and said rod become anchored in said hole; and securing means for securing said element to said second end portion.

3,859,890

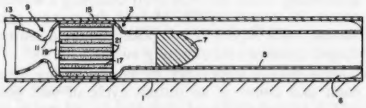
TRAVELING TUBE EJECTOR SYSTEM

William D. Guthrie, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washinton, D.C.

Filed Dec. 23, 1968, Ser. No. 786,489

Int. Cl. F41f *3/04*

U.S. Cl. 89—1.8 **8 Claims**



1. A traveling tube ejector system comprising:

an open ended launching tube having rear and forward ends; an ejection tube slidably mounted in said launching tube for ejection out said forward end of said launching tube, said ejection tube having a forward barrel portion, an intermediate portion and rear rocket nozzle; a projectile mounted at one end of said barrel portion and adjacent said intermediate portion, and a propellant charge mounted in said intermediate portion, said propellant charge, upon ignition, simultaneously communicating gases to the nozzle and the projectile to thereby cause the projectile to be moved forward in said barrel portion and out the other end of said barrel portion at the same time said ejection tube is being forced forward through said launching tube and ejected out said forward end of said launching tube by the gases exhausted through said nozzle.

3,859,891

ROTOR FEED FOR AN AUTOMATIC FIREARM SUPPLIED BY A SINGLE LINK HOOK AND EYE CHAIN BELT

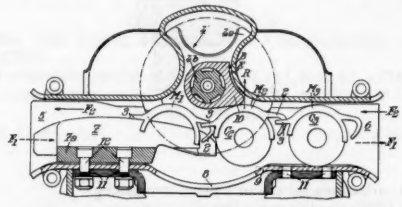
Bernard Pierre, Lyon, France, assignor to Etat Francais, Paris, France

Filed Oct. 11, 1973, Ser. No. 405,256

Claims priority, application France, Oct. 13, 1972, 72.36250

Int. Cl. F41d *9/02*

U.S. Cl. 89—33 CA **8 Claims**



1. Feed, for the supply of an automatic firearm by a cartridge belt with single hook and eye links, of which the extraction post comprises a central star wheel rotor keyed on a longitudinal shaft whose axis is situated in the vertical plane of symmetry of the assembly of the feed at a level such that the star wheels project into the central upper zone of a transverse passage, formed of two opposite passages, into which a belt of cartridges formed by means of hook and eye links passes, the removal of the link-freed cartridges operating longitudinally by the action of a pusher passing through an opening formed in a central zone of the floor of the above-said transverse passage, which is situated between the above-said opposite channels, said feed comprising a fixed support cam situated in the central zone of the extraction station at the level passed by

the back of the links, said cam existing, in the transverse sense, over at least the fraction of the transverse passage in which the extraction of the cartridges occurs when the cartridge belt passes in the direction F_2 reverse to the conventional direction F_1 for which the hooks of the links are directed forwardly, so that the feed lends itself to routeing of the cartridge belt, either in the conventional direction F_1 (hooks of the links directed forwardly) for which there is no risk of breakage of the belt by unhooking in the extraction phase, or in the reverse direction F_2 (eyes of the links directed forwardly) the cam then resisting lifting and unhooking of the link in the extraction phase under the effect of the upward reaction then exerted on this link which continues to travel in the direction F_2 under the action of the rotor thereby correctly driving the following link and the remainder of the belt, said support cam being mounted free in rotation on the shaft of the rotor, and being keyed angularly by cooperation of a channel with a boss of the corresponding shape belonging to the fixed casing of the feed.

3,859,892

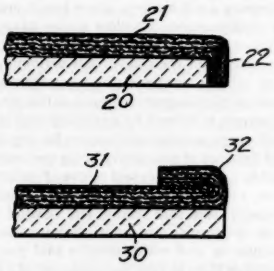
COMPOSITE CERAMIC ARMOR

Samuel H. Coes, 385 Daris Rd., Northboro, Mass. 01532

Continuation of Ser. No. 594,649, Nov. 14, 1966, abandoned. This application Mar. 14, 1969, Ser. No. 809,060

Int. Cl. F41h *5/04*

U.S. Cl. 89—36 A **1 Claim**



1. A composite armor plate having a free edge, including a ceramic front plate and a resin bonded glass fiber cloth laminated backing plate bonded to said front plate, for protection against high energy projectiles, the edge portion of said backing plate being bent at an angle of substantially 180°, folded back onto and bonded to itself, to reinforce said free edge against impact of high energy small arms projectiles near said free edge.

3,859,893

GEAR HOBBING MACHINES

Brian Hodgson, Rowlands Gill, England, assignor to Machine Tool Divisional Services Limited, Coventry, Warwickshire, England

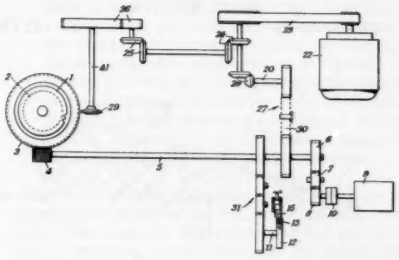
Filed May 17, 1973, Ser. No. 361,349

Claims priority, application Great Britain, May 17, 1972, 23134/72

Int. Cl. B23f *5/20*

U.S. Cl. 90—4 **3 Claims**

1. A convertible gear hobbing machine having a gear train interconnecting a hob and a table for carrying a workpiece to be machined by the hob, the gear train being selectively disconnectable from said table to permit cutting a stationary workpiece by a milling cutter substituted for the hob, a subsidiary motor operable to impart an increment of indexing rotation to the workpiece table between successive cutting operations of the milling cutter, an index plate geared to the table supporting the workpiece and arranged when the milling cutter is to be used to perform a predetermined integral number of revolutions for each indexing movement of the workpiece table, a bolt which is engageable with the index plate to lock the table against rotation, a counter for counting the revolutions made by the index plate when the bolt is withdrawn and causing arrest of the index plate and reengagement of the bolt after the predetermined number of revolutions of the index plate have been performed, and a second counter which operates at the end of each indexing operation to count the number of indexing movements made by the workpiece table and to terminate machining when all the teeth have been cut on the workpiece.



3,859,894

BAG-MAKING MACHINE

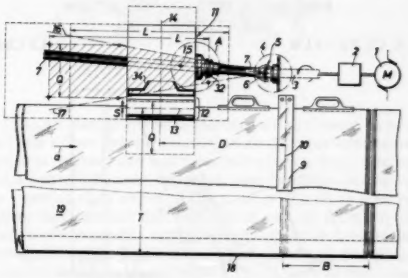
Friedhelm Mundus, Lengerich of Westphalia, Germany, assignor to Windmoller & Holscher, Lengerich of Westphalia, Germany

Filed Nov. 28, 1973, Ser. No. 419,532

Claims priority, application Germany, Dec. 1, 1972, 2258925

Int. Cl. B31b *1/86*

U.S. Cl. 93—8 WA **1 Claim**



1. A machine for making sacks or bags from heat-sealable material, comprising a work unit which is independently displaceable in two directions perpendicular to one another and is driven by a drive shaft disposed at a fixed location, a power input shaft for the work unit, and a propeller shaft connecting said input and drive shafts by respective joints located adjacent the input and drive shafts, the propeller shaft being provided with length compensating means, wherein the input shaft or the drive shaft is in the form of a cantilever-mounted hollow shaft and the associated joint is a centrally free joint comprising a ring which is pivoted to an annular flange attached to the hollow shaft and which is also pivoted to a sleeve, said propeller shaft passing through the centrally free joint and through the hollow shaft, said sleeve making a posi-

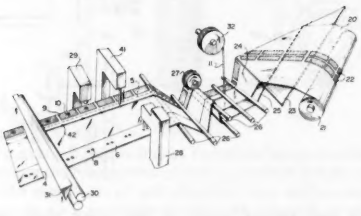
tive rotary drive connection to the propeller shaft but being longitudinally displaceable thereon.

3,859,895

METHOD OF MAKING RECLOSEABLE FLEXIBLE BAG

David B. White, Willowdale, Ontario, Canada, assignor to E. S. & A. Robinson (Canada) Ltd., Toronto, Ontario, Canada

Filed Sept. 12, 1972, Ser. No. 288,434
Int. Cl. B31b *1/90*
U.S. Cl. 93—35 DS **13 Claims**



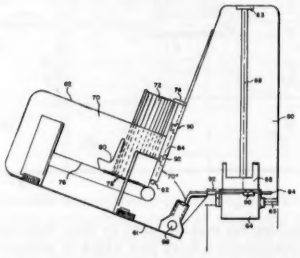
1. A method of making a recloseable bag of a flexible sheet material which comprises continuously passing a pair of superimposed layers of said sheet material along a defined path to a sealing station and a cutting station where said layers are sealed and cut transversely of their direction of travel to form a pair of opposite edges of said bag; and during passage along said defined path, continuously passing an elongated deformable member to, and sealing said member on, the face of one of said layers transverse to said edges; and continually punching holes through said layers at the points where the member intersects the portion of the layers which are subsequently cut at the cutting station, while at the same time punching out the adjacent section of said deformable member.

3,859,896

VERTICAL CARTON ERECTOR

Herman Dewitt Mims, Charlotte, N.C., assignor to D and B Machine Company, Charlotte, N.C.

Filed Apr. 3, 1973, Ser. No. 347,494
Int. Cl. B31b *1/50*
U.S. Cl. 93—51 R **13 Claims**



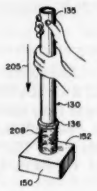
1. A vertically positioned carton erecting apparatus of the type wherein a stationary die and reciprocable plunger are carried by a frame, said apparatus including a carton blank reservoir remote from said die and plunger and comprising a carton hopper having a base upon which a plurality of flat carton blanks rest on edge, means carried by said hopper to sequentially, releasably present the undersides of said carton blanks to carton blank feeding means in proper orientation for registration on said die means; carton blank feeding means carried by said apparatus to advance to said hopper, engage the underside of the presented carton blank which will become the outside face of the floor of the carton and to directly pull it onto the top of said die in carton erecting position, said carton blank feeding means being operable as the sole means for transferring and properly registering said blank on said die.

3,859,897

TOOL KIT AND METHOD FOR MAKING PAPER SCULPTURE ARTICLES

James Z. Higa, 271 Sylvan Rd., Glencoe, Ill. 60022

Continuation-in-part of Ser. No. 881,481, Dec. 2, 1969, Pat. No. 3,685,400. This application May 30, 1972, Ser. No. 257,653The portion of the term of this patent subsequent to Aug. 22, 1989, has been disclaimed.
Int. Cl. B31d *5/04*
U.S. Cl. 93—84 TW **22 Claims**



1. A hand tool for forming pliable sheet material into tubes and for crimping each tube along the total length thereof, said tool comprising a rod having a given length and a given cross-sectional configuration, a hollow sleeve having a wall thickness sufficient to provide a substantially stiff and rigid sleeve, the outer surface of the sleeve wall defining an outer gauge surface of tubular configuration on which a hollow open-ended tube of pliable sheet material with a given inner cross-sectional extent is formed by wrapping pliable sheet material about said gauge surface, said sleeve having first and second ends, said first end of said sleeve being unobstructed to permit easy slidable removal from said sleeve of each tube formed on said sleeve, a flange which is fixed to and which extends laterally outwardly from said second end beyond said gauge surface so as to provide an inner abutment surface which is perpendicular to and contiguous to said gauge surface and which receives thereagainst the end edge of a sheet of pliable material when the material is being formed into a tube thereby to square the end edge of the tube during the formation thereof, said flange also providing an outer bearing surface at said second end of said sleeve for applying even pressure against one end edge of a tube during the crimping thereof, said rod having a smooth outer surface and being of a cross-section corresponding to the cross-section of said sleeve, the cross-sectional extent of said outer surface of said sleeve relative to the cross-sectional extent of said rod being such that the inner cross-sectional extent of a tube formed on said sleeve is greater than the cross-sectional extent of said rod to permit the tube easily to be fitted over said rod, and is sufficiently greater than said cross-sectional extent of said rod so as to permit generally unhindered crumpling of a tube on said rod without tearing, but not so great as to result in haphazard irregular crumpling and crimping of each tube on said rod, and a base having a generally flat upper surface and a socket which opens into said flat upper surface and extends into said base and which is adapted to receive one end of said rod for supporting same in a generally upright position, at least one end of said rod being sized to fit in said socket, the space between the inside of a tube and said rod outer surface defining an inward deformation limitation space which limits the inward extent of the inward creases of a tube, the engagement of the inward creases with said rod outer surface during crumpling of the tube being such that said rod outer surface provides vertical guidance for the tube to enhance even pressure distribution on the tube during crumpling, crumpling of a tube being effected between said flange and said flat surface when

the tube, after it is removed from the sleeve, is placed over said rod with said one end of said rod received in said socket, said sleeve is positioned over said rod with said flange positioned to engage an end edge of the tube and an operator firmly grips said sleeve outer surface and pushes said sleeve and flange downwardly toward said flat surface thereby to crumple the tube and to provide the crumpled tube with outward and inward creases defining a substantially regular crimp pattern along the total length of the tube.

3,859,898

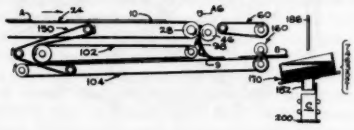
METHOD OF AND APPARATUS FOR STACKING FLEXIBLE ARTICLES

Orrin H. Besserdich, and Donald C. Crawford, both of Green Bay, Wis., assignors to FMC Corporation, San Jose, Calif.

Division of Ser. No. 198,385, Nov. 12, 1971, Pat. No. 3,766,701. This application July 26, 1973, Ser. No. 382,807

Int. Cl. B31b *1/94*

U.S. Cl. 93—93 M **10 Claims**



1. A method of accumulating a group of articles from a lane of uniformly interspaced articles moving at a predetermined infeed rate comprising the steps of diverting a number of incoming articles along a curcuitous path, directing the remaining articles at a predetermined first spaced distance apart along an adjacent path, and combining the diverted articles with the remaining articles by placing certain ones of the articles in one path between predetermined ones of the articles in the other path for delivery to an accumulating zone, the resulting order of articles being different than the initial order, and the delivery rate to said accumulating zone being zero during the diverting step and increased relative to said predetermined rate during the combining step.

3,859,899

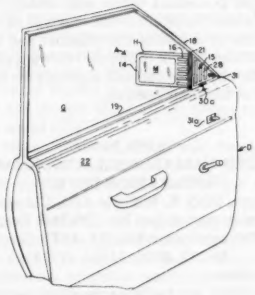
INTERIOR VENTILATION SYSTEM WITH SIDE VIEW MIRROR DE-ICING

John Edward Mills, 15142 Drake Rd., Strongsville, Ohio 44136

Filed Feb. 14, 1974, Ser. No. 442,676

Int. Cl. B60h *1/24*

U.S. Cl. 98—2 **18 Claims**



1. In an automotive vehicle having a body providing an enclosed space as a passenger compartment and a side view mirror mounted on that body exterior at a position viewable by the driver of the vehicle through a compartment window, the combination including:

a said passenger compartment;

a side view mirror unit comprising

a mirror element,

mirror mounting means including

a hollow housing having a mirror view opening in a trailing side or wall of the housing, mirror supporting means supporting the mirror in the housing proximate to said opening, a hollow base mounting the housing on the said body exterior for conducting, to the housing, compartment interior air introduced thereto at the place of attachment on the body, said housing providing air discharge area at the margin of said opening and around the periphery of said mirror element, whereby interior air introduced into said housing in passing to said air discharge warms said mirror element for deicing and like purposes;

and

an interior air exhaust controlling passageway from said compartment space to the locus of attachment of the mirror base, whereby said passageway and mirror unit form a ventilating system exhaust for the compartment space.

3,859,900

AIR CURTAIN SYSTEM

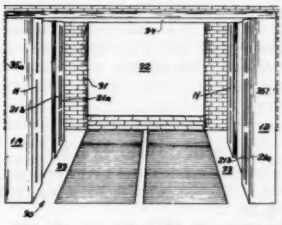
Marc Fordsmand, 38 Skovshovedvej, Charlottenlund, Denmark (2920)

Filed Feb. 8, 1973, Ser. No. 330,712

Claims priority, application Denmark, Feb. 11, 1972, 623/72

Int. Cl. F24f *9/00*

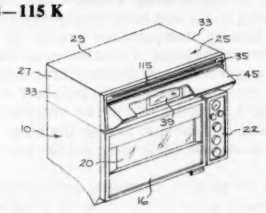
U.S. Cl. 98—36 **5 Claims**



1. An air curtain system comprising a room having an outer wall and a door opening therein, an air chamber intermediate said door opening and said room and having a floor, a ceiling, and a pair of side walls extending from the door opening into the room at right angles to the outer wall, and at least one blower unit adjacent one side wall of said air chamber, said blower unit extending in a horizontal direction substantially through the entire length of the air chamber and extending in a vertical direction substantially from the floor to the ceiling, and comprising an elongated cabinet of substantially rectangular cross section having bottom and top walls, a pair of side walls and a pair of end walls, cyclone means for developing a cyclone of air in said air chamber, said cyclone means comprising an air intake aperture in one of said side walls adjacent one of said end walls, and a pair of exhaust apertures in said side wall adjacent the other end wall, spaced in a horizontal direction from said intake aperture by a distance so that the air traveling from said exhaust apertures interacts with the air traveling to said intake aperture so as to form said cyclone of air therebetween, said apertures extending in the full height of the cabinet from the bottom wall to the top wall thereof, a partition in said cabinet intermediate said intake and exhaust apertures dividing the cavity of the cabinet into an air intake chamber and an exhaust chamber, an aperture in said parti-

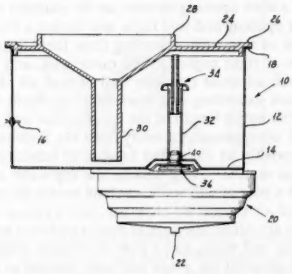
tion, and a blower mounted on said partition adjacent the aperture therein.

3,859,901
RECIRCULATING VENTILATING HOOD
James A. White, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.
Filed Feb. 25, 1974, Ser. No. 445,449
Int. Cl. F24c *15/20*
U.S. Cl. 98—115 K **5 Claims**



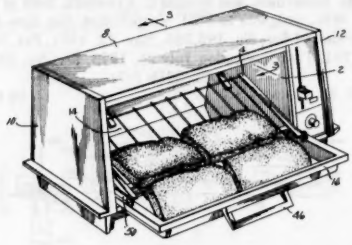
1. A recirculating ventilating hood for installation on the top of an oven, said hood comprising a hollow housing with at least a top wall, a rear wall, opposite side walls, and a front wall having an air inlet opening, first filter means in said inlet opening, a spring-mounted motor-blower unit suspended from the top wall of the housing and exhausting through a clean air outlet in the said front wall, and a large filter box attached to the underside of the motor-blower unit and carried thereby, said filter box having a thin, flat shell of large area with a top wall, a rear wall, widely spaced opposite side walls, and a front wall that is open along its bottom portion, and an enlarged opening in the top wall of the shell, shelf means within the filter box shell at both sides of the said opening for supporting a second filter means in the bottom portion of the filter box shell, whereby the large area of the second filter means allows for a large volume of air flow at a relatively slow speed and a low noise level and relatively low motor and filter means temperatures.

3,859,902
POUR IN COFFEE MAKER
Charles G. Neumann, Palatine, and Leroy Peterson, Hoffman Estates, both of Ill., assignors to Reynolds Products Inc., Schaumburg, Ill.
Filed June 28, 1973, Ser. No. 374,375
Int. Cl. A47j *31/54*
U.S. Cl. 99—304 **19 Claims**



1. In a coffee maker for making coffee by the batch, a hot water supply system including in combination, a hot water tank having a bottom formed with an outlet opening, a pipe in said tank extending upwardly from said opening for an appreciable distance to a predetermined level in said tank, a siphon forming member having an inlet, means manually removably mounting said siphon forming member on said pipe with said inlet adjacent to the upper end of said pipe, a heater in said tank, and means for introducing cold water into said tank adjacent to the bottom thereof.

3,859,903
ELECTRIC OVEN TOASTER TOAST SERVER MECHANISM
Frederick M. Kipp, Fairfield, Conn., assignor to General Electric Company, Bridgeport, Conn.
Filed May 14, 1973, Ser. No. 359,910
Int. Cl. A47j *37/08*
U.S. Cl. 99—391 **12 Claims**



1. An electric oven toaster comprising:

a. top, bottom, and side wall means forming a cooking and toasting chamber of substantial width, height and depth and said cooking chamber having an enlarged front opening;

b. a generally horizontal rack for supporting bread in a generally horizontal position in said cooking chamber or for supporting other food in a generally horizontal position in said cooking chamber, said rack having a forward portion and a rearward portion, the forward portion of said rack being pivotally mounted adjacent to the side walls of said cooking and toasting chamber in said toasting and cooking chamber, and said rearward portion being supported against downward movement when in said horizontal position but being free to be lifted upwardly;

c. first electric heating means mounted in said cooking and toasting chamber closely adjacent to the top wall means and spaced a substantial distance above said rack;

d. second electric heating means mounted in said cooking and toasting chamber closely adjacent to the bottom wall means and spaced a relatively short distance below said rack; and

e. a lift finger positioned within said cooking and toasting chamber closely adjacent to the rear wall of said chamber between the rear wall of the chamber and the rearward portion of said rack for lifting the rearward portion of said rack to thereby pivot the rack and slide the toast or other food out of the front opening.

3,859,904
AUTOMATED VARIABLE SELECTION SANDWICH PREPARATION DEVICE
Jose B. Carriazo, 2619 N. Whipple Ave., Chicago, Ill. 60647
Continuation-in-part of Ser. No. 209,760, Dec. 20, 1971, abandoned. This application Feb. 14, 1973, Ser. No. 332,283
Int. Cl. B32b *31/04, 31/18*
U.S. Cl. 99—450.4 **9 Claims**

8. An automated sandwich preparation mechanism comprising in combination,

a housing,

sandwich ingredient selection control means mounted on said housing to permit the selection of sandwich food ingredients from among a variety of such ingredients,

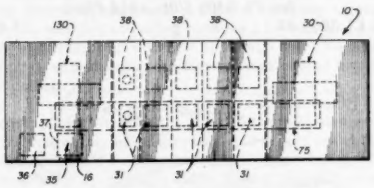
said ingredient selection control means comprising a plurality of electrical control elements actuated by manual switches thereby to establish the selected food ingredient deposition sequence and ultimately determining the specific sandwich food ingredient makeup,

first bread source means mounted within said housing,

said first bread source means including a plurality of bread chambers, thereby to permit variable selection of bread type,

a plurality of food ingredient source means mounted within said housing,

each of said food ingredient source means comprising an elongated chamber mounted within said housing and being dimensionally sized to retain a mass of a particular food ingredient therein and being further provided with a pivotally movable bottom cover plate at the lower end of said chamber for normally supporting and retaining said food ingredient within said chamber and food slicing means adjacent the lower end thereof for slicing a predetermined thickness of said food ingredient from the lower end of said chamber and permitting the deposition of said food ingredient onto the slice of bread after the same has been operatively moved into position thereunder, said slicing means being sequentially actuated by said ingredient selection control means and said slicing means and said cover plate being sequentially interconnected whereby the advancement of said slicing means into slicing relation with said food ingredient causes a concomitant timed displacement of said cover plate from a supporting and retaining position to an open position,



second bread source means mounted within said housing and including a plurality of bread chambers thereby to permit variable selection of bread type,

said first and second bread source means each comprising a series of four interconnected circumferentially arranged elongated chambers, said chambers being rotationally mounted on a shaft within said housing, thereby to be rotationally movable in response to the ingredient selection control means to position a predetermined chamber in operative position,

said first and second bread source means being further operatively interconnected together and with said ingredient selection control means whereby the selection of a particular bread type through said ingredient selection control means results in the coordinated movement of said first and second bread source means to dispense the identical bread type,

conveying means mounted within said housing and positioned beneath said first bread source means, said food ingredient source means, and said second bread source means,

said conveying means being sequentially movable along a longitudinal path to advance the sandwich ingredients from one station to the next adjacent station in response to the ingredient selection control means, until a completed sandwich is prepared,

sandwich cutting means positioned at the terminal end of said conveying means whereby the completed sandwich may be cuttingly halved,

and access means provided in said housing to provide said access therethrough to the completed sandwich for removal therefrom.

3,859,905

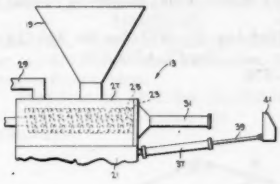
APPARATUS FOR MAKING CHEESE

Miron J. Roberts, Glenview, and Heinz F. Runge, Niles, both of Ill., assignors to Kraftco Corporation, New York, N.Y.

Division of Ser. No. 114,647, Feb. 11, 1971, , which is a continuation-in-part of Ser. No. 768,391, Oct. 17, 1968, Pat. No. 3,562,910. This application Aug. 15, 1973, Ser. No. 388,548

Int. Cl. A01j *25/12;* **A23c** *19/02*

U.S. Cl. 99—454 **6 Claims**



1. A system for forming cheese curd into a curd mass to be made into natural type cheese comprising means for holding cheese curd particles having the moisture level of finished cheese, means for forming said curd particles into a curd mass of desired shape, transfer means providing a series of separate, continuously, forwardly moving pockets for accepting units of curd particles from said holding means and for transferring said units of curd particles to said forming means, first vacuum means for establishing a vacuum within said transfer means and second vacuum means for establishing a vacuum on said curd mass after it is formed.

3,859,906

APPARATUS FOR PROCESSING OF FOODSTUFFS AND THE LIKE, PARTICULARLY MILK PRODUCTS

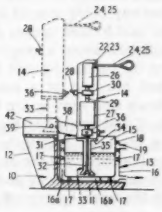
Arthur Bratland, Maudsvei 9, Heie, 3140 Notteroy, Norway

Filed Nov. 29, 1973, Ser. No. 420,061

Claims priority, application Norway, Dec. 5, 1972, 4451/72

Int. Cl. A23c *23/00;* **B01f** *5/08, 7/16*

U.S. Cl. 99—460 **4 Claims**



1. An apparatus for processing of foodstuffs and the like, particularly milk products, comprising a support means for supporting a foodstuff receiving container (**15**) and for supporting driving means (**14**) for the processing of foodstuffs or the like, characterized by a separate means (**31**) for connecting the rotor (**32**) of a homogenizing unit (**33**) with the motor of the apparatus, which means is separate from the connection means (**22, 23**) of the ordinary mixing, stirring and beating devices (**24, 25**), and is making it possible to connect the rotor (**32**) directly to the driving motor (**27**) of the apparatus, whereas the operation of the other devices being disengaged, and for disengaging the rotor from said driving motor while the other devices are connected to the driving motor, and a

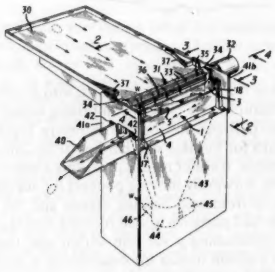
pivotal support (**38**) by which the driving unit (**14**) of the apparatus can be pivoted from a first position for the operation of mixing, stirring and beating devices (**24, 25**), immersed in the material to be processed in the container (**15**), to a second position for the operation of the homogenizing unit (33), immersed in the material to be processed in the container, which container (**15**) is provided with an arrangement for exterior heating and cooling of the container and its contents as required.

3,859,907

BOILED EGG DESHELLER

Glenn Hatcher, Denver, Colo., assignor to Foodfac Inc., Westwood, N.J.

Filed Aug. 23, 1973, Ser. No. 390,724
Int. Cl. A23n *5/00*
U.S. Cl. 99—570 **12 Claims**



1. Apparatus for deshelling hard boiled eggs, comprising an elongated box-like deshelling basket having ends and opposite side walls with openings in the top, bottom and one end of the basket, an inclined runway extending lengthwise in said basket and having a lower end directed toward said end opening so that eggs deposited on said inclined runway will roll down the runway and be discharged through said end opening, opposite lateral edges of said runway being spaced inwardly from the respective side walls of said basket, means pivotally supporting said basket for oscillation about a longitudinal axis above said runway and means for oscillating said basket about said axis through a selected arc and at a selected frequency, whereby eggs rolling down said runway are buffeted between the opposite side walls of said oscillating basket to break and remove the shells from the eggs, the shelled eggs being discharged through said end opening and the broken shells falling through the spaces between said runway and the side walls of the basket and through the open bottom of the basket.

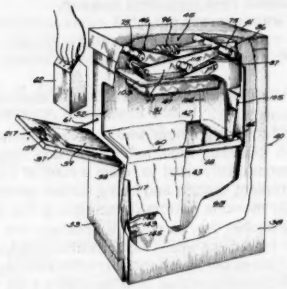
3,859,908

COMPACTOR

Robert F. Karls, Hales Corners, and James H. Enright, Racine, both of Wis., assignors to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 177,385, Sept. 2, 1971, Pat. No. 3,772,984. This application Apr. 23, 1973, Ser. No. 353,920
Int. Cl. B30b *15/14*
U.S. Cl. 100—53 **21 Claims**

1. A trash compactor having a housing with a door, a ram in the housing, a motor for the ram, a motor control including switches, a door latch, a single lever control for sequentially actuating the latch and said switches, said single lever control comprising a lever, means on which the lever is moved in one direction to start the motor and in the other direction to stop the motor and means responsive to moving the lever in its



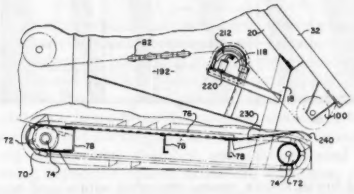
motor starting direction to actuate said door latch and prevent opening said door during ram operation.

3,859,909

HAY ROLL FORMING MACHINE

Aquila D. Mast, Lancaster, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Apr. 24, 1973, Ser. No. 353,943
Int. Cl. B30b *5/06;* **A01d** *39/00*
U.S. Cl. 100—88 **5 Claims**

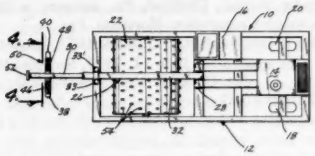


1. A mobile hay roll-forming machine comprising in combination, a mobile frame, lower endless apron means in the lower portion of said frame having an upper course extending substantially horizontally, means operable to move said upper course rearwardly in said machine, means to deliver a swath of agricultural product to the forward end of said upper course of said lower apron means, upper roll forming means in said machine operable to cooperate with said endless lower apron means to form said swath of product into a roll, said lower endless apron comprising a plurality of endless flexible members spaced from each other transversely across said machine, bottom means extending across the lower portion of said machine and having guide means for the upper courses of said endless flexible members extending longitudinally of said machine relative to the direction of movement thereof along a field, upstanding lugs on said flexible members engageable with the lower surface of a roll of said product and operable to move the same rearwardly while said upper roll-forming means engages and moves the upper surface of said roll forwardly and thereby revolves said roll about its axis while supported in said machine, and means associated with said guide means and projecting rearwardly beyond the upper course of said lower endless apron and comprising support means for a roll of agricultural product said rearwardly projecting means being spaced transversely to provide spaces through which said upper courses of said flexible members move downward and thereby positively disengage said lugs from a roll of said product.

3,859,910
DEMOLITION DEVICE

Floyd R. Swanson, Jr., P.O. Box 508, Cedar Falls, Iowa 50613

Filed May 14, 1973, Ser. No. 360,309
Int. Cl. B30b *15/00, 3/02*
U.S. Cl. 100—100 10 Claims

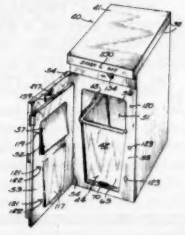


1. A demolition device comprising,
a wheeled frame means having rearward and forward ends, a compacting wheel means rotatably mounted on said frame means adjacent the forward end thereof,
power means on said frame means for driving said compacting wheel means,
means for steering said wheeled frame means,
a boom means having rearward and forward ends, the rearward end of said boom means being operatively secured to said frame means, said boom means extending forwardly from said frame means and having a first horizontal boom member, and a second vertically extendable boom member extending between a forward end portion of said frame and said first horizontal boom member for raising and lowering the forward end of said first boom member,
and a grapple means on said boom means forwardly of said compacting wheel means and said second boom member and rearwardly of said forward end of said boom means, said first boom member having at least two boom sections longitudinally movable with respect to each other to permit movement of said grapple means toward and away from said compacting wheel means.

3,859,911
COMPACTOR

Robert F. Karls, Hales Corner, and James H. Enright, Racine, both of Wis., assignors to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 177,385, Sept. 2, 1971, Pat. No. 3,772,984. This application Apr. 23, 1973, Ser. No. 353,922
Int. Cl. B30b *15/30*
U.S. Cl. 100—215 1 Claim

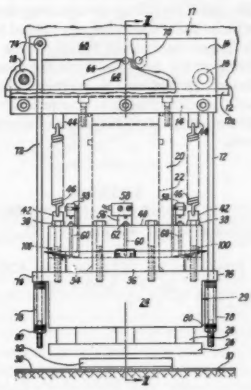


1. In a trash compactor of the character described the combination with a housing for a trash basket and ram assembly of a double door therefor, one of said doors comprising an innermost service door having a loading port above the level of the basket, said housing having an unobstructed chuting space above said basket and opposite said loading port and a loading door over said loading port, said loading door having a hinge by which it is connected to the service door and about which the loading door may be swung away from the service door to open said loading port to admit trash through the loading port and said unobstructed chuting space into the basket, said loading door having a panel which projects inwardly through said loading port in the service door and which overhangs the rim of the trash basket when both the loading door and the service door are closed.

3,859,912
HIGH FREQUENCY WELDING AND CUTTING MACHINES

Anton Muhlbach, Frankfurt/Main-Sossenheim, Germany, assignor to USM Corporation, Flemington, N.J. and USM Corporation, Boston, Mass.

Filed Sept. 28, 1972, Ser. No. 293,167
Int. Cl. B30b *15/24*
U.S. Cl. 100—257 1 Claim

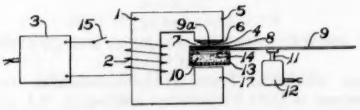


1. In a cutting machine having a piston driven platen for forcibly engaging a die against a workpiece and table, said platen being slidably supported through the piston and cylinder means on a beam having a surface which is accurately oriented in parallel relation to the work surface of the table, means for insuring even engagement between the work surface of the platen and the die during cutting comprising:
A. stroke limiting means connected to the piston driven platen having a surface parallel to the work surface of the platen for engagement with a surface on the machine which is locked in parallel relation to the work surface of the table;
B. clamping means operatively connected to the platen to lock a machine surface against the beam in parallel relation to the work surface of the table as the platen moves into engagement with the die; and
C. limit switch means actuatable at a plurality of points about the engagement surface of the stroke limiting means when said means are engaged to maintain the work stroke of the platen until each of the limit switches has been actuated.

3,859,913
APPARATUS AND PROCESS FOR PRINTING

Alfred F. Leatherman, Columbus, Ohio, assignor to William C. Heller, Jr., Milwaukee, Wis.

Continuation of Ser. No. 67,810, Aug. 28, 1970, abandoned, which is a continuation of Ser. No. 506,960, Nov. 9, 1965, Pat. No. 3,526,708. This application Feb. 9, 1973, Ser. No. 331,037
Int. Cl. B41f 5/00
U.S. Cl. 101—1 5 Claims

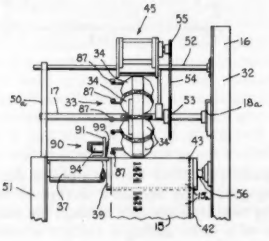


1. An article of manufacture comprising a particle receiving sheet material having fibers defining a plurality of particle receiving openings extending through the sheet material, a plurality of dry magnetized particles mechanically lodged and firmly mechanically held by said fibers within said openings and defining an indelibly imprinted character in said material, said particles being essentially, solely mechanically held by the fibers within the sheet material as a result of said mechanical lodging of the particles within the openings between the fibers and said particles being mechanically lodged within said openings with sufficient mechanical holding force by said fibers to prevent erasing of the particles from the sheet material, said particles being formed of a magnetically hard material whereby such particles define magnets in the paper, said particles have an average particle size of approximately 0.001 to 80 microns.

3,859,914
JUMBO NUMBER PRINTING DEVICE

Glenn L. Strickland, 107 Miami Ave., Rt. 5, Piedmont, S.C. 29640

Filed Dec. 19, 1973, Ser. No. 426,044
Int. Cl. B41l 45/00
U.S. Cl. 101—76 7 Claims



1. an apparatus for printing consecutive jumbo numbers on sheets forming a web of material comprising:

A. an elongated housing,

B. a plurality of spaced axles carried by said housing,

C. a rotatable cylinder carried on each of said axles,

D. each of said cylinders having at least five circumferentially and equally spaced printing wheels rotatably carried thereon, extending radially outwardly from said axles in longitudinal alignment therewith,

E. jumbo printing characters carried on the periphery of said transverse printing wheels,

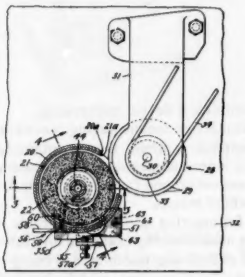
F. means for feeding said web of material under each of said rotatable cylinders wherein one character of a total number is printed by each cylinder on each sheet of said web of material, and

G. indexing means advancing said printing wheels in a predetermined sequence for printing consecutive jumbo numbers on said sheet.

3,859,915
INK ROLL CARTRIDGE

Alexander Hunter, Chalfont, Pa., assignor to Decision Data Computer Corporation, Horsham, Pa.

Division of Ser. No. 159,811, July 6, 1971, Pat. No. 3,785,288. This application June 11, 1973, Ser. No. 368,995
Int. Cl. B41f 31/30; B41j 27/20
U.S. Cl. 101—103 5 Claims

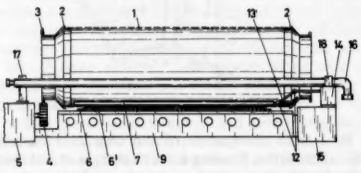


1. Printing apparatus for use with a rotary print head, comprising, an ink roll cartridge including a pair of casing elements, an ink roll inside the casing elements, means mounting said casing elements for rotational movement with respect to one another between a position in which the roll is encased by said casing element and a position in which it is exposed for contact with such print head, a pivotal mounting member supporting said ink roll cartridge, securement means carried by said cartridge and said pivotal mounting member and cooperable to secure said ink roll cartridge upon said pivotal mounting member, and stop means movable with said pivotal mounting member for limiting the movement of said member between a cartridge-loading position and a position in which the roll is disposed for contact with such a print head, and means for interconnecting said casing elements and said securement means such that force exerted in a direction to engage said securement means effects such movement of said casing elements as to expose said ink roll, and force exerted in a direction to disengage said securement means effects such movement of said casing elements as to encase said ink roll.

3,859,916
DEVICE FOR WORKING, PARTICULARLY PRINTING OF SHEET MATERIALS

Peter Zimmer, Untere Sparchen 54, A 633 Kufstein, Austria

Continuation of Ser. No. 181,054, Sept. 16, 1971, abandoned. This application Sept. 27, 1973, Ser. No. 401,252
Int. Cl. B41f 15/42, 15/44
U.S. Cl. 101—119 9 Claims



1. A device for the printing of a predetermined precise

pattern on sheet material with a liquid or viscous printing compound, said device comprising:

a perforated cylinder screen mounted for rotation against said sheet material;

means operatively connected to said cylinder screen for rotating said cylinder screen at a desired circumferential speed;

a roller squeegee mounted for rotation within said cylinder screen to contact the inner periphery thereof adjacent the line of contact between said cylinder screen and said sheet material;

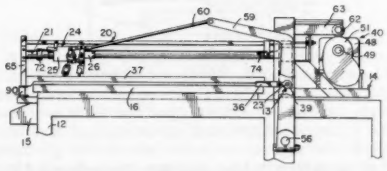
means operatively connected to said roller squeegee for rotating said roller squeegee at the same circumferential speed as said cylinder screen is rotated by said means for rotating said cylinder screen, to thereby avoid relative frictional rotation between said cylinder screen and said roller squeegee; and

means, separate from and not connected to said roller squeegee or said means for rotating said roller squeegee, for supplying a liquid or viscous printing compound to a position adjacent said cylinder screen and said roller squeegee at the upstream side of said roller squeegee, whereby rotation of said roller squeegee and said cylinder screen forces said compound through the perforations in said cylinder screen and onto said sheet material without smearing said compound to thereby print said predetermined precise pattern on said sheet material.

3,859,917
SCREEN PRINTING PRESS

Henry J. Bubley, Deerfield, and Claude H. Oltra, Chicago, both of Ill., assignors to American Screen Printing Equipment Company, Chicago, Ill.

Filed Oct. 24, 1972, Ser. No. 299,689
Int. Cl. B41f *15/00*
U.S. Cl. 101—123 **17 Claims**

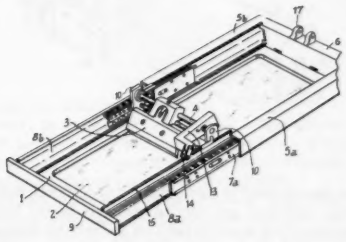


1. A printing press, including fixed frame, a bed supported on said frame and having an upwardly facing surface to receive work to be printed, a second frame pivotally mounted on said first frame, a pair of spaced-apart arms mounted on a front portion of said second frame for pivotal movement therewith toward and away from said bed, a chase pivotally mounted beneath said arms, said chase being positioned over said work on said bed during printing, a screen removably mounted on said chase, carriage assembly means mounted on said arms for movement therealong, a drive arm pivotally mounted on said first frame and connected to said carriage assembly means, press drive means mounted entirely on a rear portion of said second movable frame to move said carriage assembly means reciprocally along said arms during a printing cycle and to pivot said second movable frame relative to said first fixed frame during the printing cycle, means operatively connecting said press drive means mounted on said second frame to said drive arm means pivotally mounted on said first frame, said press drive means operatively engaging said first frame to pivotally move said second frame about a pivot point disposed generally in the horizontal plane of said surface of said bed adjacent a rear edge of said surface and allowing said rear portion of said second frame on which said press drive means is mounted to be swung below said horizontal plane of said surface of said bed during the printing cycle, such positioning of said pivot point thereby eliminating smearing of work placed on said bed, by preventing any portion of said screen from contacting said work to be printed during movement of said second frame during a printing cycle, said press drive means moving said second movable frame and said drive arm relative to one another during said printing cycle such that, for a desired period of time, the disposition of said means connecting said press drive means to said drive arm causes said carriage assembly means to be maintained adjacent a selected point along said arms during the upward movement of said second frame to thereby eliminate creep of said carriage assembly means along said arms and resulting dripping of ink.

3,859,918
ADJUSTABLE SCREEN FRAME HOLDER

Bernard Dargols, 75 Rue des Montalaus, Colombes, France

Continuation of Ser. No. 102,868, Dec. 30, 1970, abandoned. This application Aug. 30, 1973, Ser. No. 393,032
Claims priority, application France, Dec. 30, 1969, 69.45481
Int. Cl. B41f *15/36, 15/42*
U.S. Cl. 101—127.1 **3 Claims**



1. A silk screen printing assembly comprising in combination: a screen structure including a screen and a support frame for said screen; a support structure to which said support frame is mounted, said support structure including rigid frame member having parallel spaced legs joined by a transverse leg, and parallel spaced telescopic elements supported within said parallel spaced legs for telescopic movement relative thereto; a carriage; a squeegee; means mounting said squeegee to said carriage, and means mounting said carriage to said support structure for relative movement with respect to said support structure, wherein the telescopic movement permits the mounting of screen structures of varying length to said support structure, and wherein a stencil is applied to a surface positioned beneath the printing assembly by the relative displacement of said squeegee and said telescopic elements.

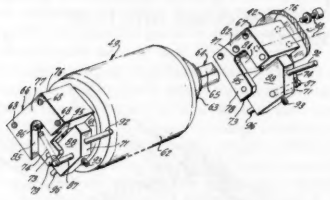
3,859,919
INKER UNIT FOR CONTINUOUS-MOTION PRINTER

John P. Skrypek, Saddle Brook; Edward J. Whelan, Hasbrouck Heights, and Enn Sirvet, Washington Township, all of N.J., assignors to Sun Chemical Corporation, New York, N.Y.

Filed Mar. 21, 1973, Ser. No. 343,453
Int. Cl. B41f *31/30*
U.S. Cl. 101—349 **4 Claims**

1. Ink distributing means for a decorating press including first and second rolls normally rotatable on respective parallel laterally offset first and second axes with the peripheries of said rolls in engagement, first means including portions defining relatively stationary guideways for directing said first roll toward said second roll, first and second axial extensions for said first roll projecting beyond the respective ends thereof and supported by the respective first and second guideways after being entered therein through entrances thereof, first and second retainers operatively associated with said first and second guideways, respectively, to retain the respective first

and second extensions in said guideways, second means to bias said extensions along said guideways whereby said first roll is urged into engagement with said second roll, each of said first and second retainers being operable between a holding and a releasing position, each of said first and second retainers when in its said holding position blocking the entrance of its associated guideway to interfere with removal of said extensions from said guideways, each of said first and second retainers when in its said releasing position clearing the entrance of its associated guideway to permit removal of said extensions from said guideways through the entrances thereof, said second means being connected to the first means and acting through the first and second retainers when the latter are in said holding position to urge said extensions away from said entrances and deeply into said guideways, said second means having a line of action that is repositioned as the first and second re-



tainers are operated to said holding and releasing positions to maintain said first and second retainers in the holding or releasing position to which the first and second retainers have been operated, first and second pivots mounting the respective first and second retainers to the first means, said line of action moving overcenter to opposite sides of said pivots as said first and second retainers are operated to the respective holding and releasing positions, first and second adjustable stops for controlling the magnitude of biasing forces exerted by said fourth means on said first roll, said first and second stops being mounted to the respective first and second retainers and operatively engaging the respective first and second extensions when the first and second retainers are in their holding positions whereby adjustment of said stops is effective to control spacings between said extensions and said first and second retainers thereby controlling positions of the latter and by so doing serving to adjust loading of said first means.

3,859,920

METHOD OF MAKING A HECTOGRAPHIC MASTER

Gerhard Ritzerfeld, Schorlemer Allee 14, 1000 Berlin 33, Germany

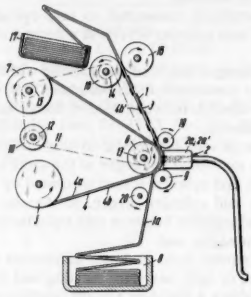
Filed Mar. 30, 1973, Ser. No. 346,701

Claims priority, application Germany, Apr. 12, 1972, 2218267

Int. Cl. B41m *5/18*

U.S. Cl. 101—467 **5 Claims**

1. A method of making a master for a hectographic copying process, comprising the steps of simultaneously advancing a non-transparent paper web having an obverse and a reverse side and provided with a thermally sensitive layer on its obverse side, together with a carrier web having a thermally transferably color layer, in incremental steps past an operating station; contacting said color layer with said reverse side of said paper web at said operating station; and applying heat to selected portions of said obverse side of said paper web at said operating station so as to produce true-image indicia on said obverse side by localized discoloration of said thermally sensitive layer and to simultaneously transfer to said reverse side portions of said color layer corresponding in shape to said indicia, said portions of said color layer adhering to said reverse side and forming thereon mirror-image replicas of said



indicia which are subsequently transferable to copy sheets in a hectographic copying process as true images of said indicia.

3,859,921

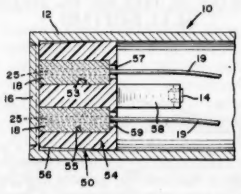
DETONATOR HOLDER

Robert L. Stephenson, Sterling Heights, Mich., assignor to Allied Chemical Corporation, New York, N.Y.

Division of Ser. No. 162,898, July 15, 1971, Pat. No. 3,746,214. This application Apr. 16, 1973, Ser. No. 351,228

Int. Cl. F42b *3/04*

U.S. Cl. 102—22 **2 Claims**



1. An assembly to hold an explosive charge disposed in a gas chamber comprising

a body portion provided with at least one opening to accommodate at least one explosive charge;

a first wedge means connected to said body portion;

and a second wedge means comprising a plurality of legs extending from said body portion, wherein said first wedge means comprises the tapered shape of said body portion having a maximum outer dimension approximately equal to the inside diameter of said gas chamber.

3,859,922

TWO PIECE AMMUNITION ROUND

Abner Kaplan, Palos Verdes, and William J. Dean, Hawthorne, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

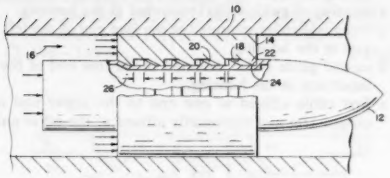
Filed June 28, 1973, Ser. No. 374,602

Int. Cl. F42b *13/16, 31/00*

U.S. Cl. 102—93 **2 Claims**

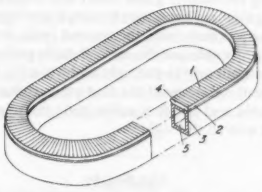
1. A transfer means comprising; an interface for transferring a load radially from one member to a second member; said interface including teeth on said second member; said members having one tooth in load bearing engagement, each of said members having a groove pitch to separate said teeth, the groove pitch of said first member being slightly larger than the groove pitch of said second member so that the spacing between successive mating teeth progressively increases

whereby the area of pressure surface contact is progressively increased by the compression of the sabot material and the



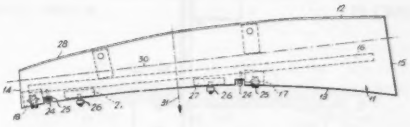
elongation of the projectile material bringing successive teeth into load bearing engagement with each other.

3,859,923
TRANSPORT SYSTEMS
Norbert Hamy, Don Mills, Ontario, Canada, assignor to Tebron Holdings Limited, Don Mills, Ontario, Canada
Filed Sept. 29, 1971, Ser. No. 184,831
Int. Cl. B61b *13/08*
U.S. Cl. 104—23 FS **26 Claims**



1. A closed loop transport system comprising a support body having a duct formed therein, a rigid articulated belt disposed about said support body over said duct and forming a closed loop about said body, said belt comprising a plurality of individual load-supporting cooperatable segments which are relatively movable and which are constructed with a substantially air impervious material, each of said segments having an end margin which is opposed to an end margin of a next adjacent segment, connecting means interconnecting said segments for articulated movement relative to each other and in such manner that the end margin of one segment is opposed to the end margin of the next adjacent segment, said connecting means also providing a substantially air impervious construction between the end margins of each of two adjacent segments in the articulated belt, said belt being slightly spaced from said support body at least for portions of its length to form an air bearing space intermediate the underside of said belt and said support body, sealing means associated with said segments and which provides sealing contact along at least one side of the segments and the support body in the direction of movement thereof in such manner that the sealing contact and the air impervious construction of said connecting means provides a substantially air impervious seal to thereby maintain the air bearing space, and means forming a plurality of apertures in said support body on the surface over which said belt passes, said apertures being in communication with said air bearing space and the interior of support body for supplying pressurized air to the air bearing space from within the support body to generate an air bearing within the air bearing space, said belt being located on said support body and with respect to said duct so that the pressurized air which passes through said apertures into said air bearing generates the air bearing for supporting said belt about said support body during its movement about the support body.

3,859,924
TRANSPORT SYSTEMS
David Lilley Turner, Leamington Spa, England, assignor to National Research Development Corporation, London, England
Continuation of Ser. No. 22,172, March 24, 1970, abandoned. This application Feb. 23, 1972, Ser. No. 228,724
Int. Cl. B65g *21/12*
U.S. Cl. 104—25 **12 Claims**

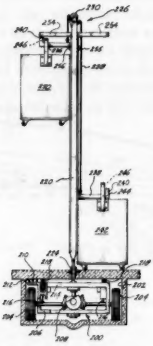


1. Transport apparatus comprising:
a plurality of oblong elements having longer, curved forward and rear edges and shorter left and right side edges; at least one rail passing through a relatively straight segment and a curved segment as seen in plan;
cooperating means between each oblong element and said rail for guiding each oblong element along said rail;
the curved forward and rear edges of all said elements having substantially equal radii of curvature, so that adjacent curved edges of adjacent elements are complementary;
said oblong elements being arranged in a series in successive forward edge to rear edge engagement along said rail;
means for propelling said oblong elements along said rail including through said curve;
the relation of the adjacent curved forward and rear edges of said elements to one another and to the rail and said cooperative guiding means being such that when said elements are disposed more transversely and less longitudinally of said rail their velocity along the rail is decreased and when said elements are disposed less transversely and more longitudinally of said rail their velocity is increased; a second rail laterally spaced from, but generally paralleling the first-mentioned rail; the second rail being disposed more closely to the first-mentioned rail laterally adjacent the relatively curved segment of the first-mentioned rail and the second rail being disposed further from the first-mentioned rail laterally adjacent the relatively straight segment of the first-mentioned rail;
cooperating guiding means between each element and said second rail for guiding each element along the second rail; whereby the divergence and convergence of said rails is effective to change the heading of said elements;
each element consisting of two separate portions lying adjacent one another longitudinally of the rails, said two separate portions including a first portion which has a concave front edge and a concave rear edge and has said left and right side edges, and a lenticular second portion having one convex edge configured to slide against and lie adjacent one said concave edge of said first portion, and another convex edge configured to slide against and lie adjacent one said concave edge of the first portion of an adjacent element;
roller means interposed between adjacent curved edges of adjacent elements to provide rolling engagement between adjacent elements.

3,859,925
TRANSPORTATION SYSTEM

Billy J. Hartz, 4016 N.E. 110th, Seattle, Wash. 98125

Continuation-in-part of Ser. No. 77,060, Oct. 1, 1970, abandoned, and Ser. No. 344,092, March 23, 1973, Pat. No. 3,791,308. This application Oct. 15, 1973, Ser. No. 406,533
Int. Cl. B61d 5/00
U.S. Cl. 104—88 8 Claims



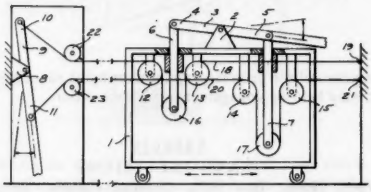
1. A transportation system comprising:
an elongate passageway means, at least a portion of which underlies and is substantially parallel to a roadway, said passageway means defining running surfaces, said running surfaces having reaction surface means therein for providing vertical and overturning moment reaction components, said passageway means communicating with ground level through a single elongate slot;
running gear means positioned for movement within said passageway means upon said running surfaces;
strut means having a bottom portion connected to and supported by said running gear means and having a top portion extending upwardly through said slot, said strut means including lift means thereon for supportively engaging a load carrying compartment means, said lift means for raising and lowering said compartment means relative to said strut means between ground level and the top portion of said strut means, the top portion of said strut means having an upwardly extending height sufficient to position said compartment means a distance above ground level whereby pedestrian and vehicular traffic traversing said roadway at ground level and parallel to said passageway means can pass underneath said compartment.

3,859,926
CABLE CONTROL SYSTEM FOR TRANSMITTING POWER

Clayton B. Strohschein, De Ridder, La., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 1, 1973, Ser. No. 328,872
Int. Cl. B61b 7/00
U.S. Cl. 104—178 5 Claims

1. A cable control system for transmitting power, comprising a movable housing having an input fulcrum thereon;
an input arm pivotally mounted on the input fulcrum and having a left end and a right end;
a left input arm pivotally mounted on the input arm at the left end thereof and hanging downward into the housing;
a right input arm pivotally mounted on the input arm at the right end thereof and hanging downward into the housing;
a stationary output fulcrum positioned at right angles to the input fulcrum;
an output arm pivotally mounted on the output fulcrum and having an upper end and a lower end;
a plurality of guide rollers mounted in the housing;
a first guide roller mounted at the free end of the left input arm in the housing;
a second guide roller mounted at the free end of the right input arm in the housing;
a first cable affixed at one end to the upper end of the output arm and stationarily affixed at the other end and

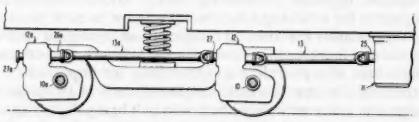


abutting the first guide roller and some of the plurality of guide rollers; and
a second cable affixed at one end to the lower end of the output arm and stationarily affixed at the other end and abutting the second guide roller and others of the plurality of guide rollers whereby when the right end of the input arm is depressed the second guide roller depresses the second cable and the second cable pulls the lower end of the output arm to the right and when the left end of the input arm is depressed the first guide roller depresses the first cable and the first cable pulls the upper end of the output arm to the right.

3,859,927
ARTICULATED RAILWAY BOGIE SHIFTABLE DRIVE ASSEMBLY

Andre E. Pelabon, Paris, France, assignor to ANF Frangeco S.A., Courbevoie, Hauts de Seine, France

Filed Apr. 13, 1973, Ser. No. 350,806
Int. Cl. B61c 9/30, 15/14; B61f 3/04
U.S. Cl. 105—98 7 Claims

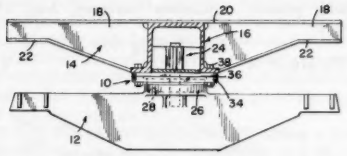


1. In a system for transmitting power from the prime mover fixedly attached to the frame of a railcar to the wheels of a bogie supporting said railcar, said bogie being movably secured to said railcar frame, said prime mover having a rotary output element, said bogie including a power transfer mechanism having a housing and a rotary input element, a cardan shaft having a fixed length to be connected between said input and output elements, said input element comprises a first spur gear journalled in said housing for rotation about an axis fixed with respect to the housing and for axial displacement along said axis resulting from relative movement between said bogie and railcar, and means in said housing to transmit rotational force from said input element to a bogie wheel, said means also including a second spur gear mounted in said housing for rotation about an axis parallel with and in meshing engagement with said first spur gear to maintain the amount of said transmitted force constant regardless of said axial displacement of the first gear.

3,859,928
RAILWAY CAR ARTICULATED CENTER PLATE

Franklin P. Adler, Michigan City, Ind., assignor to Pullman Transport Leasing Co., Chicago, Ill.

Filed Sept. 21, 1973, Ser. No. 399,788
Int. Cl. B61f *5/18, 5/50;* **F16c** *17/08*
U.S. Cl. 105—199 C **5 Claims**



1. A center plate construction for a railway vehicle including a body bolster and a supporting wheel truck bolster, the improvement comprising:

a bowl supported on said truck bolster,

a center plate including a generally cylindrical central portion disposed in said bowl, and having an upper cylindrical portion projecting upwardly from said bowl,

said upper cylindrical portion including a cylindrical flange projecting circumferentially outwardly from said cylindrical portion,

an attaching flange plate having an outer cylindrical rim,

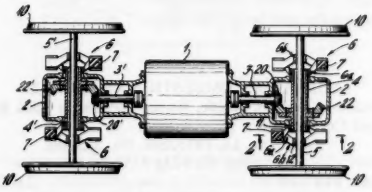
said rim including an inner stepped down attaching portion providing a cylindrical seat for said cylindrical flange of said cylindrical portion to confine said center plate against substantial lateral movement, and

means rigidly connecting said flange plate to said body bolster.

3,859,929
RESILIENT DOUBLE AXLE RAILWAY CAR DRIVE

Gerhard Korn, Mulheim/Ruhr, and Ernst Piepenbreier, Essen, both of Germany, assignors to Rheinstahl AG, Essen, Germany

Filed Sept. 6, 1973, Ser. No. 394,572
Int. Cl. B61c *9/44;* **B61f** *3/04*
U.S. Cl. 105—131 **12 Claims**

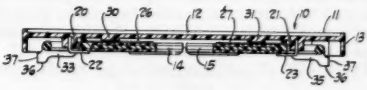


1. A double-axle drive for rail vehicles comprising a rail truck housing, first and second longitudinally spaced transverse wheeled axles rotatably supported on said truck housing, a hollow shaft rotatably supported on said truck housing and surrounding each axle, a drive motor on said truck housing located between said axles having a drive shaft at respective ends, gear means between each of said drive shafts and said hollow shafts at the respective ends of said motor to rotate said hollow shafts upon rotation of said drive shafts, and an elastic coupling connected adjacent each end of said hollow shaft to each first and second axle to rotate each of said axles, said elastic couplings including radially extending coupling arms with an inner hub portion secured to each of said axles and said hollow shafts respectively, with the arms secured to the hollow shafts being alternately circumferentially arranged with respect to the arms of said axles and having outer ends which are spaced apart radially, said coupling arms comprising spokes extending radially from their associated hub portions and resiliently interengaged to transmit driving force in a plane therebetween.

3,859,930
TILTABLE TRAY WITH PIVOTALLY MOUNTED LEGS HAVING EXTENSIBLE FEET

Peter G. Sherwin, 1450 Cordova Ave., Lakewood, Ohio 44107

Continuation-in-part of Ser. No. 238,787, March 28, 1972, abandoned, which is a continuation-in-part of Ser. No. 131,855, April 7, 1971, abandoned. This application Mar. 29, 1973, Ser. No. 346,046
Int. Cl. A47f *5/12, 41/04*
U.S. Cl. 108—6 **15 Claims**



1. A tray structure comprising:

a. a platform defining a planar top surface;

b. a pair of legs pivotally carried beneath said platform near opposite end regions thereof and being movable between a retracted position where said legs are folded beneath said platform to an extended position where said legs depend from said platform to support said platform at an elevated height above a horizontal supporting surface;

c. leg locking means interposed between said platform and said legs for selectively locking said legs in said retracted and extended positions;

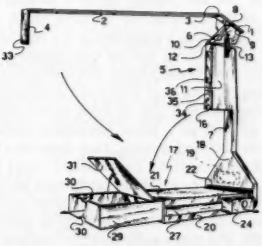
d. a pair of extensible feet each being movably carried by a separate one of said legs and each being movable along an arcuate path between a retracted position where bottom portions of said feet cooperate with said legs to support said platform horizontally above a horizontal supporting surface when said legs are extended, to extended positions where said bottom portions depend from said legs; and

e. feet locking means interposed between said feet and said legs for locking said feet selectively at one of a plurality of predetermined extended positions for supporting said platform in inclined attitudes relative to a horizontal supporting surface.

3,859,931
FOLDABLE TABLE UNIT FOR AN AUTOMOBILE

Alexandre Roger Lalonde, 98 Charette St., Chelmsford, Ontario, Canada

Filed Oct. 1, 1973, Ser. No. 402,351
Int. Cl. A47b *23/04*
U.S. Cl. 108—44 **5 Claims**



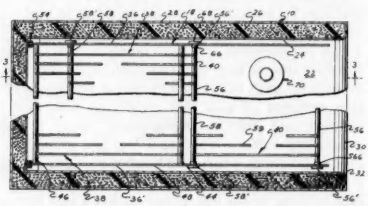
1. A foldable table unit for an automobile comprising an elongated mounting bracket adapted to be secured to the roof

of an automobile inside the passenger compartment, a rigid supporting arm means hinged at one end to said mounting bracket about a first hinge axis, a table hinged at one end to the other end of said support arm means about a second hinge axis, said hinge axes being parallel and extending in a direction transverse to the longitudinal axis of said bracket, said supporting arm means having a first abutment at said one end and a second abutment at said other end resting against said mounting bracket and against said table respectively, in the operative position of said unit, and defining a predetermined angular relationship between said bracket and said supporting arm means, and between the latter and said table respectively, said supporting arm means hanging down from said bracket and said table horizontally extending in cantilevered fashion from said supporting arm means in said operative position of said unit, said table foldable against said supporting arm means about said second axis and said supporting arm means together with said table foldable against said automobile roof about said first axis to an elevated inoperative position, and means to releasably maintain said table and supporting arm means in said elevated inoperative position.

3,859,932
ADJUSTABLE SHELF ASSEMBLY

William J. Armstrong, Jeffersontown, Ky., and Donald G. McDowell, Jr., New Albany, Ind., assignors to General Electric Company, Louisville, Ky.

Filed Sept. 6, 1973, Ser. No. 394,925
Int. Cl. A47b *11/00*
U.S. Cl. 108—75 **2 Claims**

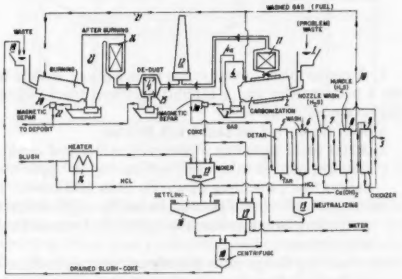


1. An adjustable shelf assembly comprising a pair of parallel side frames adapted to be supported in cantilever fashion from a vertical wall at the rear of the shelf assembly, a rigid shelf portion attached between the side frames at the rear portion of the side frames, and a movable shelf portion adapted to be supported from the side frames, and slidable means joining the movable shelf to the side frames so that the movable shelf is movable between a first raised position at the front of the shelf assembly so that its top surface is generally in the same horizontal plane as the top surface of the rigid shelf and a second lowered position when the movable shelf generally underlies the rigid shelf, said slidable means comprising elongated slot means in the two side frames and low friction bearing means supported on the sides of the movable shelf, said elongated slot means comprising a front slot and a rear slot in each side frame, the said bearing means comprising a front bearing member operating in each front slot and a rear bearing member operating in each rear slot, each rear slot having an upwardly inclined section just in front of the front edge of the rigid shelf as well as a short horizontal section at the top portion of the inclined section, each front slot having a taller upwardly inclined section adjacent the front portion of the side frame as well as a longer horizontal section at the top portion of the said last-mentioned inclined section, the frontmost portion of the said longer horizontal section comprising a downwardly and rearwardly directed section to serve as an automatic locking means, whereby when the front bearing members of the movable shelf are lowered into the said downwardly directed section the movable shelf tends to shift slightly toward the rigid shelf and substantially close the gap between the movable shelf and the rigid shelf and form a single horizontal continuous shelf.

3,859,933
WASTE DISPOSAL METHOD AND SYSTEM

Jurgen Von Klenck, Dusseldorf, Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Aug. 22, 1973, Ser. No. 390,411
Claims priority, application Germany, Aug. 23, 1972, 2242012
Int. Cl. F23g *7/00*
U.S. Cl. 110—8 R **11 Claims**



1. In a method for the combined processing for disposal of industrial, problem waste, of problem free waste and of slush as resulting from sewage treatment, wherein the problem waste is pyrolytically carbonized, and wherein the resulting coke is mixed with the slush, filtered and drained, the improvement comprising:

providing a continuous carbonizing of the problem waste by means of revolving the problem waste while heating it under exclusion of air to obtain coke in a progressing carbonization of the revolving problem waste;

heating the slush to a temperature of about 60° to 80° centigrade;

mixing the coke as provided by the carbonization with the heated slush to obtain a coke-slush mixture;

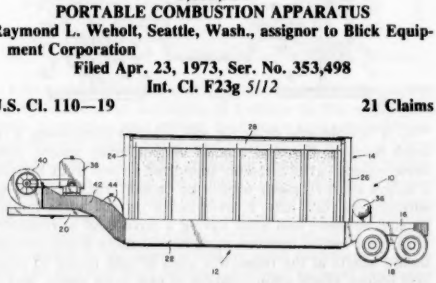
mixing the mixture with the problem free waste to obtain a coke-slush waste mixture; and

burning the said latter mixture.

3,859,934
PORTABLE COMBUSTION APPARATUS

Raymond L. Weholt, Seattle, Wash., assignor to Blick Equipment Corporation

Filed Apr. 23, 1973, Ser. No. 353,498
Int. Cl. F23g *5/12*
U.S. Cl. 110—19 **21 Claims**



1. A combustion apparatus especially adapted to burn low ash, moderately high heat content material such as wood waste products, said apparatus comprising:

a. a housing having a longitudinal axis and comprising a front portion, a back portion and at least two upwardly reaching side walls,

b. said housing having a substantially open top area and providing a first lower combustion zone and a second combustion zone positioned above said first combustion zone in said open top area,

c. a first longitudinally extending air discharge means located proximate an upper side portion of one of said side walls and arranged to direct a curtain of air laterally and inwardly in a first direction having a substantial horizontal component across said top area into said second combustion zone,

d. a second longitudinally extending air discharge means located proximate a second upper side portion of said housing and arranged to direct a second curtain of air generally laterally and inwardly across said top area into said second combustion zone in a second direction having a substantial horizontal component generally opposing said first direction, and

e. said first and second curtains of air having a velocity sufficient that the curtains interengage at said second combustion zone to form counter rotating intermixing air currents to accomplish substantially complete combustion of said combustion products.

3,859,935

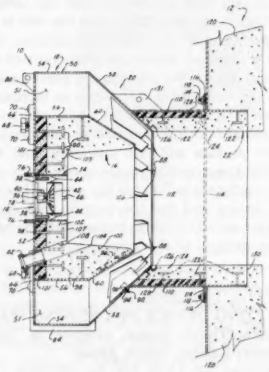
PROCESS USING A COMBINATION, OIL, GAS, AND/OR SOLID BURNER

Dale E. Walker, Winfield, Kans., assignor to Peabody Gordon-Piatt, Incorporated, Winfield, Kans.

Continuation-in-part of Ser. No. 294,620, Oct. 3, 1972, Pat. No. 3,827,851. This application Mar. 11, 1974, Ser. No. 449,913

Int. Cl. F23c *1/02*

U.S. Cl. 110—22 A **10 Claims**



1. The process for burning combustible particulate material comprising introducing said particulate material into a combination burner means adapted to burn oil, gas, and/or solid fuels, having a fuel oil and/or gas inner burner means having means therewith to connect same to a source of oxygen containing gas, a primary combustion chamber having a divergent end portion and positioned adjacent and in substantially coaxial surrounding relation with the outlet of said inner burner means, a passageway, the outer end thereof adjacent and in flow communication with the outlet of said combustion chamber, means with the inlet of said passageway to connect same to a source of oxygen containing gas and a source of particulate combustible solid material, a conduit in one end portion surrounding and in communication with said outlet end of said passageway and said primary combustion chamber and mountable in the other end portion in a furnace wall or the like, said combination burner means being constructed and adapted to burn fuel oil and/or gas in said inner burner means and said combustion chamber, and simultaneously or alone subsequent to said burning burn combustible particulate solid material passed with oxygen containing gas through said passageway into the outlet of said combustion chamber, said passageway in operation passes said solid material and said oxygen containing gas mixture into said conduit at said divergent end portion of said combustion chamber for the combustion of said mixture, said passageway is annular and surrounds said divergent end of said primary combustion chamber, said passageway has a plurality of adjustably mounted air-directing vanes therein, and said means with the inlet of said passageway to connect same to a source of oxygen containing gas and a source of particulate solid material is a manifold means.

3,859,936

FABRIC FEEDING DEVICE FOR SEWING MACHINES

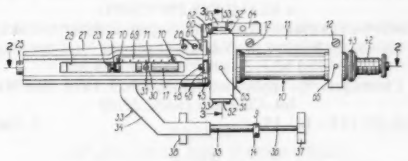
Nereo Bianchi, Pavia, Italy, assignor to Necchi S.p.A., Pavia, Italy

Continuation of Ser. No. 142,938, May 13, 1971, abandoned. This application Jan. 25, 1974, Ser. No. 436,782

Claims priority, application Italy, May 15, 1970, 42907/70

Int. Cl. D05b *3/04*

U.S. Cl. 112—76 **4 Claims**



1. A sewing maching having a fabric feeding device comprising: a fabric gripping means and a drive means for driving said gripping means along a rectangular path, said drive means comprising a fluid actuated first cylinder having a first piston therein and a piston rod rigid with said first piston and rigidly attached to said gripping means, whereby reciprocations of said first piston are transmitted to said gripping means in correspondence to two of the parallel sides of said rectangular path, a second cylinder and piston therein, a multi-way valve means for directing a pressurized fluid respectively into opposite ends of said second cylinder so as to drive the second piston alternately in opposite directions, said second piston being drivingly connected to the first mentioned cylinder so as to oscillatingly rotate said first mentioned cylinder and piston about their own axis pursuant to reciprocations of said second piston to drive said gripping means along the other two parallel sides of said path.

3,859,937

METHOD OF AND APPARATUS FOR FEEDING A WORKPIECE TO A DART-FORMING SEWING MACHINE

Horst Fenzl, Oerlinghausen, Germany, assignor to Durkoppwerke GmbH, Bielefeld, Germany

Filed May 24, 1974, Ser. No. 472,991

Claims priority, application Germany, May 25, 1973, 2326683

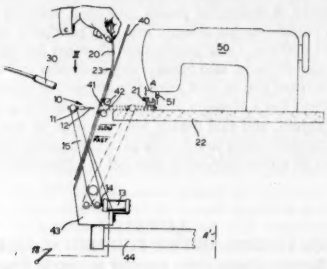
Int. Cl. D05b *35/00*

U.S. Cl. 112—131 **10 Claims**

2. An apparatus for feeding a workpiece to the stitching station of a sewing machine having at said station a flat bed, said apparatus comprising:

a flat support table adjacent and transverse to the plane of said bed, said table being formed with an aperture in line with said bed;

a folding element reciprocal through said aperture to said station; and



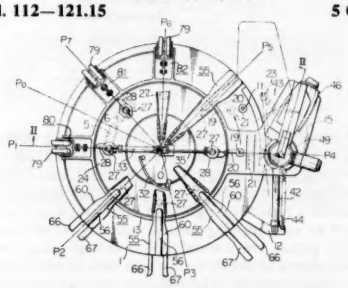
means for reciprocating said element to push a fold of said workpiece through said aperture in to said station.

3,859,938

AUTOMATIC APPARATUS FOR CLOSING THE TOE OF A SEAMLESS STOCKING

Yosinobu Fukuyama, Kashiwara, Japan, assignor to Takatori Machinery Works Ltd., Yamatotakada-shi, Nara-ken, Japan

Filed Mar. 5, 1973, Ser. No. 338,253
Claims priority, application Japan, Feb. 5, 1973, 48-13816
Int. Cl. D05b *19/00, 21/00*
U.S. Cl. 112—121.15 **5 Claims**



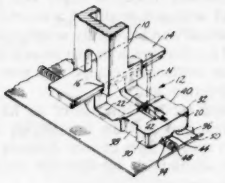
1. In an automatic toe-closing apparatus having a sewing device for closing an open toe-end portion of a seamless, knitted hose and clamping means for temporarily clamping and holding the open toe-end portion of individual, successive hose for closing by said sewing device, the improvement which comprises: a plurality of angularly spaced holding devices for individually holding thereon open toe hose for sewing and closing an open toe-end portion thereof, each holding device having a suction tube extending therethrough, mounting means mounting said holding devices angularly spaced radially about an axis and for rotating them in fixed relative positions about said axis, suction-applying means for selectively applying a suction to the individual suction tubes of said holding devices for drawing the open-toe-end portion of individual hose thereinto, each holding device having surfaces over which the invidvidual hose are drawn longitudinally inside-out after being sucked into said suction tube thereof, reversible drawing on and drawing-off means actuated automatically for drawing-on the hose inside-out over said surfaces with open toe-end portion disposed on a free end of corresponding holding device and for later drawing-off the hose from said surfaces by everting them after the open toe-end position is closed, drive means driving said mounting means rotationally about said axis to index and successively position the holding devices with a hose inside-out thereon with said open toe-end portion thereof extending therefrom for clamping thereof by said clamping means while sewn closed by said sewing device.

3,859,939

PRESSER FOOT WITH FLEX FEATURE

Howell, Robert B., 3400 W. Mercer Way, Mercer Island, Wash. 98040

Filed Mar. 28, 1974, Ser. No. 455,531
Int. Cl. D05b *29/00*
U.S. Cl. 112—235 **10 Claims**



1. A presser foot component for a sewing machine equipped with a spring biased presser bar, a material advance mechanism, and a reciprocating needle assembly, and attached to said presser bar by a mounting shank, said presser foot component comprising:

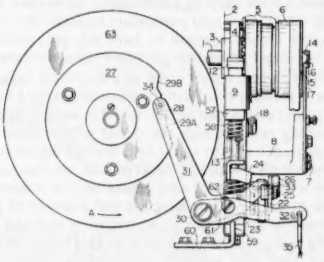
a relatively thick and stiff heel portion connectable to the mounting shank, a relatively thick and stiff tow portion, a relatively thin and flexible intermediate portion spanning between said heel and toe portions, and a heel-to-toe downwardly sloping lower presser surface, with the dimensions of said foot component and the slope of said presser surface being such that when the foot is mounted onto the presser bar of a sewing machine, and such presser bar is lowered, the intermediate portion will bend upwardly and the presser surface will press generally flat onto the fabric being sewn, and when an increased thickness portion of the fabric passes under the toe portion said intermediate portion will flex an additional amount and the toe portion will rise upwardly, and when the increased thickness portion approaches the rear end of the presser surface it will move the presser bar upwardly against its spring and the toe portion will continue to make contact with the fabric because of the heel-to-toe sloping arrangement of the presser surface.

3,859,940

THREAD CUTTING DEVICE IN A SEWING MACHINE

Shiroji Nakamura, Tokyo, Japan, assignor to Tokyo Juki Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 17, 1973, Ser. No. 397,816
Int. Cl. D05b *3/06, 65/00*
U.S. Cl. 112—252 **3 Claims**



1. A thread cutting device for cyclically operated sewing

maching having primary mover means and a mainshaft, said thread cutting device comprising

a clutch member mounted on said main shaft for transmitting and interrupting power from said primary mover means to said main shaft;

a control means rotatably mounted on the framework of said sewing machine and coupled with said clutch member for controlling the rotational movement of said main shaft being rotated by said primary mover means;

a thread cutting cam rotatably mounted on said main shaft and adapted to be rotated in response to the rotational movement of said main shaft;

pivot plate means pivotally mounted onto said sewing machine frame for being contacted by said control means and operatively positioned for contacting the thread cutting cam at predetermined time intervals in response to movement of the pivot plate means by the control means and for being reciprocally pivoted while in contact with the rotating thread cutting cam; and

thread cutting means operatively connected to said pivot plate means for cutting the thread in response to the reciprocal pivoting movement of said pivot plate means.

3,859,941

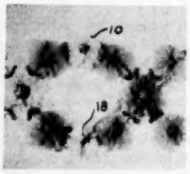
TEXTURED EMBROIDERED FABRIC

David Krieger, Emb-Tex Corp., Travelers Rest, Greenville, S.C. 29690

Division of Ser. No. 252,384, May 11, 1972, Pat. No. 3,766,872. This application June 4, 1973, Ser. No. 366,952

Int. Cl. D06c *23/04*

U.S. Cl. 112—266 **7 Claims**



1. The process for producing a textured embroidery on a ground fabric comprising stitching a heat shrinkable first face yarn to said fabric and tying said first stitches in place by a soluble bobbin yarn on the back of said fabric, stitching a second face yarn to said fabric in a pattern which only in part overlies the stitches of said first face yarn and tying said second stitches in place by an insoluble bobbin yarn on the back of said fabric, washing said fabric with a liquid which dissolves said soluble bobbin yarn while leaving said insoluble yarn intact, whereby said first stitches are freed from said fabric and form a textured mass held in place relative to the fabric by the stitches of the second face yarn where they overlay the first stitches, and heat treating said fabric to shrink the first face yarn and assist it in forming the textured mass.

3,859,942

APPARATUS FOR AND METHOD OF DIE FORMING AND PERFORATING PILFER-PROOF BAND OF CLOSURE CAPS

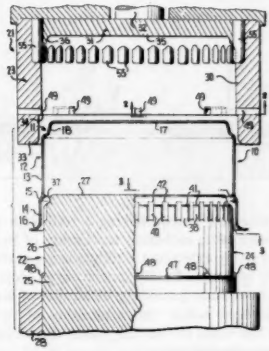
Jens L. Moller, Westmont, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Division of Ser. No. 148,604, June 1, 1971, Pat. No. 3,746,202. This application Apr. 9, 1973, Ser. No. 349,435

Int. Cl. B21d *51/00*

U.S. Cl. 113—121 A **7 Claims**

1. A die forming apparatus for perforating a closure cap skirt and forming thereon an integral pilfer-proof band, said die forming apparatus including a first die member for receiving and internally supporting a closure cap having an end panel and an outwardly enlarged lower skirt portion connected to the remainder of the closure cap by a single thickness peripheral shoulder, said first die member being of a configuration to be received within a closure cap in close fitting relation with respect to both the enlarged skirt portion and the remainder thereof with the end panel seated thereon,



and a second die member having means for shearing a closure cap through the shoulder thereof along peripherally elongated and spaced areas upon relative endwise movement of said die members.

3,859,943

SAILING GEAR FOR WATER CRAFT

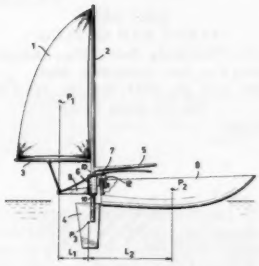
Lauri Antero Katainen, Mantyviite 4 A 14, 02100 Tapiola, Finland

Filed Aug. 10, 1973, Ser. No. 387,322

Claims priority, application Finland, Aug. 10, 1972, 2227/72

Int. Cl. B63h *9/06*

U.S. Cl. 114—39 **3 Claims**



1. A sailing device for attachment to the rear of a watercraft which comprises in combination:

A. means for fastening the sailing device to the rear of the watercraft,

B. casing support means disposed to said means for fastening,

C. a mast supported by said casing support means,

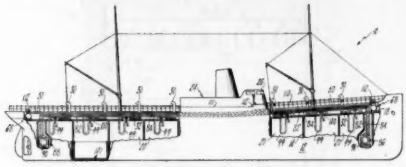
D. a boom and a sail attached to said mast,

E. a combined rudder and keel attached to said casing support means, and

F. means for maneuvering the combined rudder and keel,

G. said mast, boom, sail and combined rudder and keel all being disposed behind the rear of the watercraft, said means for maneuvering being disposed forward of the rear of the watercraft.

3,859,944
TANKER INTEGRITY SYSTEM
Gifford D. Warner, 1 Maple Ave., Essex, Conn. 06426
Filed Oct. 24, 1972, Ser. No. 299,870
Int. Cl. B63b *25/08*
U.S. Cl. 114—74 R **11 Claims**



1. In an elongated tanker having a hull with a bridge; a plurality of bulkheads, including a plurality of longitudinally spaced, transversely extending bulkheads separating the hull into a plurality of longitudinally spaced cargo sections, and an overlying deck together providing a plurality of separate substantially fluid tight holds; and a plurality of vent conduits connected to the holds for venting gases therefrom; a tanker integrity system comprising:

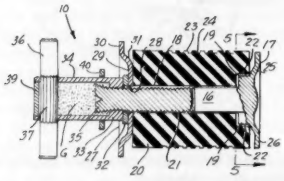
a. vent conduit closure valves mounted in the vent conduits and operable for closing the vent conduits for closing the holds connected thereto, and valve operator means including control means connecting each valve with the bridge, and means effective upon severance of the control means to close the valve leading to the holds of any section of the ship severed from the bridge;

b. a forward air compressor system at the stem of the tanker connected for supplying compressed air at least to the forward holds of the tanker;

c. further control means connecting the bridge with the forward air compressor system; and

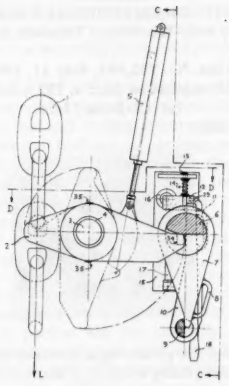
d. means responsive to severance of the stem of the tanker from the bridge to actuate the forward air compressor system to supply compressed air to the holds of the severed forward section of the tanker.

3,859,945
MARINE BAILER PLUG
Axel Moeller, St. Petersburg Beach, Fla., assignor to Moeller Manufacturing Co., Inc., Greenville, Miss.
Filed June 29, 1973, Ser. No. 375,128
Int. Cl. B63b *13/02*
U.S. Cl. 114—197 **6 Claims**



1. A marine bailer plug for insertion in a boat drain thimble comprising in combination a resilient generally cylindrical compressible plug body having opposed ends extending perpendicularly to the axis and an axial bore extending therethrough, a stem extending completely through said bore and beyond said ends including a head integral with one end of said stem, said head including a conical portion flared outwardly adjacent one end of said body beginning inwardly of said axial bore and terminating inwardly of the periphery of said head, and an annular flat portion extending outwardly from said conical portion parallel to said one end of said body, said head having a size slightly less than the inner diameter of said thimble, a compression plate on said stem at the other end of said body, said compression plate having an inner flat portion engaging said other end of said body, an outwardly flared portion on said inner portion extending away from said body and a flat outer portion parallel with said other end, said compression plate has a size greater than the diameter of said thimble with said flat outer portion of said compression plate adapted for engagement with one end of said thimble, cooperating means on said stem and said body for preventing relative rotation between said stem and body, and means on said stem for moving said compression plate toward said head to compress said body therebetween and expand said body into sealing engagement with said thimble with all of said body retained between said head and said compression plate.

3,859,946
UNDER LOAD RELEASABLE CHAIN STOPPERS
Peter G. Hammerschlag, 220 111th Ave. S.E., Bellevue, Wash. 98004
Filed Apr. 19, 1973, Ser. No. 352,402
Int. Cl. B63b *21/18*
U.S. Cl. 114—200 **6 Claims**



5. An under load releasable chain stopper of the kind having a two-legged fork-shaped chain stopper pawl for holding the chain, comprising

a. a two-legged fork-shaped chain stopper pawl

b. a frame

c. a first means mounting said chain stopper pawl in said frame so as to allow said chain stopper pawl to rotate with respect to said frame,

d. a pin rotatably supported in said frame, the ends of said pin are journaled in said frame and said pin having an indentation therein, said indentation comprising a substantially flat surface parallel to the longitudinal axis of said pin and which passes approximately through the center of said pin and being located such that said chain stopper pawl, when engaging with its forked end the chain, can go with its other end unto said surface and rest there against said pin,

e. a lever attached to said pin, this lever together with the to it attached pin being able to release said chain stopper pawl by rotation over approximately one quarter turn,

f. a member which is supported in said frame by second means, such that said lever can rest with its end against said member, when said lever is in such position that the engaged chain stopper pawl can rest into the indentation on said pin, said member being operatively connected with third means which can release said lever and thereby

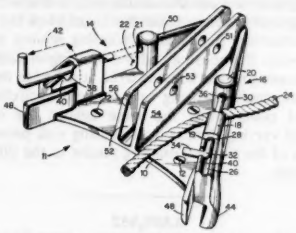
indirectly said chain stopper pawl, by shifting said member out of the way of said lever.

3,859,947

LOCKING CHOCK

Andrew C. Vavolotis, 225 South St., West Bridgewater, Mass. 02379

Filed Aug. 23, 1973, Ser. No. 391,151
Int. Cl. B63b *21/04*
U.S. Cl. 114—218 **7 Claims**



1. A locking chock comprising:

a base member adapted for mounting on a surface;

first and second spaced confronting pedestal portions integral with said base member and having smoothly rounded surfaces and defining a channel for guidance of a line extending therethrough;

said first pedestal having an opening therethrough, said second pedestal portion having a blind opening therein in alignment with the opening in said first pedestal portion; a locking pin slidably disposed in said opening in said first pedestal portion and movable between an open and a closed position, and having a stop post at one end of said locking pin adjacent said second pedestal portion and operative to engage said first pedestal portion to limit the extent of openinng of said locking pin, and a handle portion at the end opposite to said stop post;

said first pedestal portion including an arcuate groove in alignment with said opening therethrough and providing a continuation of said opening for support of said locking pin slidably disposed in said opening; and

a locking groove in said first pedestal portion angularly disposed with respect to said arcuate groove and cooperative with the handle portion of said locking pin in a locked position; and

said locking pin handle portion being angularly disposed with respect to said locking pin and operative to be retained by said locking groove when said locking pin is in its locked position.

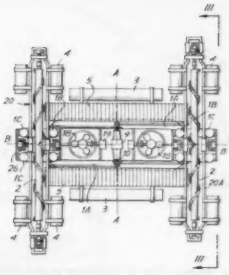
3,859,948

APPARATUS FOR CLEANING HULLS AND OTHER SUBMERGED SURFACES

Giuliano Romano, Viale dei Mille 83, Firenze, Italy (50131); Ferruccio Buonaprole, Via Fratelli Gualandi 9, Firenze, Italy (50126), and Fernando Lodi, Via Giotto 5, Firenzen, Italy (50121)

Filed Feb. 28, 1973, Ser. No. 336,558
Claims priority, application Italy, Mar. 8, 1972, 9382/72
Int. Cl. B60s *3/02*
U.S. Cl. 114—222 **13 Claims**

1. Apparatus for cleaning a submerged surface comprising, in combination, a relatively elongated main frame; driving means mounted on said main frame and engageable with the submerged surface to move said main frame along the submerged surface in a direction parallel to the length of said main frame; first hydraulic motor means on said main frame connected to said driving means to operate the latter; at least one relatively elongated second frame; mounting means mounting each second frame on said main frame at a respective end of said main frame to extend parallel to the submerged surface, said mounting means mounting each second frame and adjustably positioning each second frame in a direction parallel to its length and perpendicular to the length of said main frame; cleaning tool means arranged on each second frame and operable to clean the submerged surface during movement of said main frame along the submerged surface; and float means operable to counterbalance the weight of said apparatus..

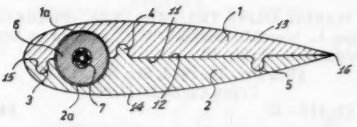


3,859,949

ENVELOPE FOR UNDERWATER CABLE, DRAG ROPES OR THE LIKE

Dietrich Toussaint, and Frank Meyer, both of Bremen, Germany, assignors to Vereinigte Flugtechnische Werke-Fokker Gesellschaft mit beschrankter Haftung, Bremen, Germany

Filed Sept. 28, 1972, Ser. No. 292,917
Claims priority, application Germany, Oct. 5, 1971, 2149592
Int. Cl. B63b *21/00*
U.S. Cl. 114—235 F **12 Claims**



1. Jacketing for underwater cables, ropes, drag ropes, etc., with streamline profile comprised of two completely separable profiled strips for individual reeling, each having a first surface to be placed into abutment with the first surface of the respective other first strip and each strip having a second surface disposed symmetrical to a plane defined by the first surfaces when placed in abutment to each other, to establish a streamline profile, resulting joints between the strips as exposed extending along leading and trailing edges of the streamline profile;

the strips each having at least one recess open to the first surface, the recesses having location and contour complementary to each other to define an elongated cavity for loosely receiving the rope or cable when the first surfaces are in mutual abutment;

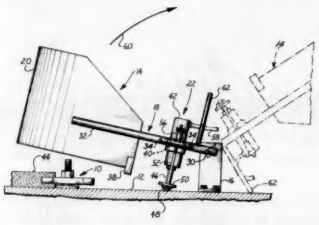
first fastening means on the strips in the first surfaces thereof for releasably interconnecting the two strips between the cavity and the leading edge of the profile; and second fastening means on the strips in the first surfaces thereof for releasably interconnecting the two strips between the cavity and the trailing edge of the profile.

3,859,950

SAFETY GUARD FOR SHAPING TOOL

Daniel R. York, 9151 E. 52nd, Tacoma, Wash. 98424

Filed Sept. 12, 1973, Ser. No. 396,602
Int. Cl. B27g *21/00, 19/00*
U.S. Cl. 144—251 A **10 Claims**



1. A safety device for a rotating cutterhead mounted on a table comprising:

guard means having a forward upright wall portion and spaced upright sidewall portions affixed to and extending rearwardly from said forward wall portion, said guard means defining a region enclosed on at least three sides, said region being sufficiently large to enclose a cutterhead protruding from said table, said guard means including a support member affixed thereto and extending rearwardly therefrom,

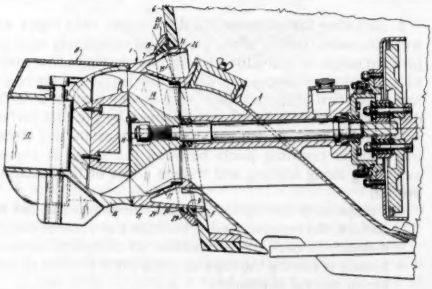
mounting means for attaching said support member to said table for selective upward and rearward pivotal movement about an axis generally parallel to said table, said axis being located rearwardly of said cutterhead, said mounting means capable of supporting said guard means for movement from a first position surrounding said cutterhead to a second position located above said first position wherein a workpiece can be moved across said table and under said forward wall and sidewall portions and from said second position to a third stowed position wherein at least a substantial portion of said guard means is positioned, relative to said first position of said guard means, rearwardly of said axis.

3,859,951

MARINE DRIVE TRANSOM SEAL APPARATUS

William L. Woodfill, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 21, 1972, Ser. No. 317,354
Int. Cl. B63h *11/00*
U.S. Cl. 115—11 **14 Claims**



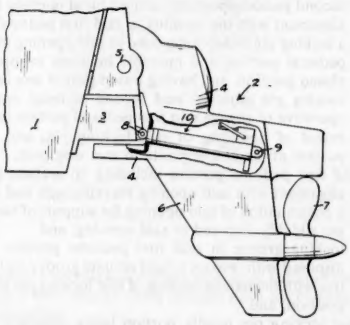
1. A sealing and mounting apparatus for a transom mounted jet propulsion unit wherein the propulsion unit may be mounted within any one of a plurality of boats having selected different angled transoms comprising in combination, a jet pump housing means having an internal boat mounting means for mounting of the housing within a boat with the housing means projecting outwardly through a transom opening and terminating rearwardly of the transom, said housing means having pump mounting means and further including an outer wall means encircling said pump mounting means, said outer wall means including a top wall and a bottom wall joined by opposite side walls, a first of said top and bottom walls being a flat wall and the second of said top and bottom walls being a vertically varying dimensional wall defining a transverse sealing cross-sectional configuration which is substantially constant in cross-section relative to said opening when in alignment with the largest-angle transom mount position and when in alignment with the minimum-angle transom mount position and with the vertical axial cross-section of the housing varying in a non-circular configuration and with a single diminishing cross-section from the location of the zero axis transom mounting, a resilient encircling sealing means disposed between the housing and the opening in said transom, and compressing means adapted to be attached to the transom and compressingly engaging said resilient encircling sealing means and compressing the same against the outer wall means, said varying dimensional housing wall permitting the adaptation of the single mounting means to the different angled transom.

3,859,952

SHOCK ABSORBING TILT MECHANISM FOR STERN DRIVES FOR BOATS

Aldo Celli, 1730 First Federal Bldg., Detroit, Mich. 48226

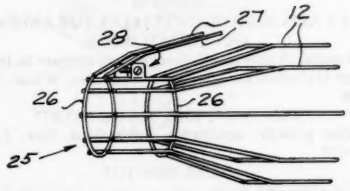
Continuation-in-part of Ser. No. 326,584, Jan. 26, 1973, abandoned. This application Feb. 15, 1974, Ser. No. 442,736
Int. Cl. B63h *5/12*
U.S. Cl. 115—41 R **13 Claims**



1. A mechanical lift and shock absorbing mechanism for a stern drive unit for a boat, said drive unit being of the type having one section fixed to the stern of the boat and another section pivotally supported thereon for upward and downward tilting movement comprising, a cylinder assembly interconnecting said fixed and tiltable sections of the drive unit, said cylinder assembly comprising a pair of cylinders coaxially telescoped one within the other, the outer cylinder being threaded over the inner cylinder, one of said cylinders being fixed against rotation relative to one section of the drive unit and the other cylinder being rotatably supported on the other section of the drive unit, means for rotating said last mentioned cylinder relative to the other to vary the effective length of said link so that, when the link is extended, the movable section is tilted upwardly and, when the link is contracted, the movable section is tilted downwardly, first coil spring means within said cylinders, means operatively connecting said first spring means with one of said sections for biasing the tiltable section to a lowered operative position, said first spring means being adapted to be compressed in response to tilting of the movable section upwardly against the bias of the spring means, second coil spring means surround-

ing said first spring means and engaging the outer periphery thereof so that the second spring means are expanded diametrically in response to compression of the first spring means, said second spring means being dimensioned to frictionally engage the bore of the cylinder enclosing the same when expanded to progressively resist further compression of the first spring means.

3,859,953
ELECTRIC TROLLING MOTOR WEED GUARD
Dean S. Todt, 674 19th St., Des Moines, Iowa 50014
Filed Mar. 12, 1973, Ser. No. 340,466
Int. Cl. B63h *5/16*
U.S. Cl. 115—42 1 Claim



1. A weed guard for an electric trolling motor having a vertical motor support, a motor mounted on the lower end of said support and having a horizontally disposed elongated cylindrical housing; said housing having forward and rearward ends; a propeller being rotatably mounted to said motor adjacent said rearward end of said housing; said weed guard comprising:

at least one member extending at least partially around and embracing said housing portion of said motor;

means for detachably securing said member to said housing;

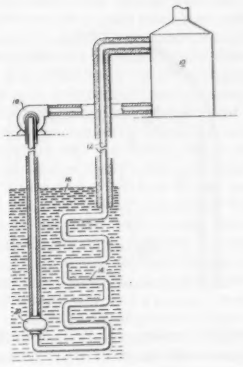
a plurality of rods fixed to said member and extending rearwardly and radially outwardly therefrom and terminating at a point at least as far rearwardly as the trailing edge of said propeller; the rearward ends of said rods being spaced radially outwardly from said propeller with respect to the rotational axis of said propeller;

the rearward ends of said rods being spaced from one another and being positioned in a circular array around said propeller;

said member extending partially around said housing at a point forward of said vertical support and including two spaced apart ends, said securing means comprising clamping means for securing said spaced apart ends together;

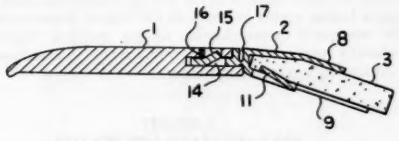
a pair of rods being fixed to said member at a point forwardly of said clamping means and extending rearwardly and radially outwardly so as to be positioned radially outwardly and in covering relation to said clamping means.

3,859,954
STEAM DRIVEN SONIC IMPLODER
Joseph Pauletich, 91-18 43rd Ave., Elmhurst, N.Y. 11373
Filed Oct. 12, 1972, Ser. No. 297,026
Int. Cl. G08b *9/00*
U.S. Cl. 116—22 A 5 Claims



1. An underwater sonic imploder comprising a boiler, a vibrator, insulated pipe connecting said boiler to said vibrator, said vibrator including an uninsulated pipe section submerged in a liquid medium, and a pump connecting said vibrator back to said boiler.

3,859,955
ENVELOPE MOISTENING DEVICE FOR A POSTAGE METER
Walter T. Labore, Stamford, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.
Filed Sept. 17, 1973, Ser. No. 398,091
Int. Cl. B05c *1/02*
U.S. Cl. 118—32 5 Claims



1. An envelope flap moistening device for use in a postage metering system, comprising:

a plastic separating member having a contoured edge for parting the flap of the envelope from a body portion thereof, to allow said flap to pass into contact with a moistening pad;

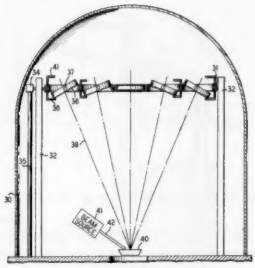
a retainer connected to said separating member for receiving an easily insertable moistening pad, said retainer having a groove-like hinge substantially extending across a width portion thereof adjacent said separating member, said hinge operatively biasing the retainer and said moistening pad towards an envelope flap passing in proximity thereto, so as to insure positive contact between said moistening pad and said envelope flap; and

a moistening pad for insertion into said retainer.

3,859,956
MULTIWORKPIECE CONDENSATION COATING APPARATUS

Carl Ralph Paola, Westfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Filed Jan. 10, 1974, Ser. No. 432,150
Int. Cl. C23c *13/08*
U.S. Cl. 118—49.1 **8 Claims**



1. Apparatus for coating a plurality of workpieces, in which each workpiece is held in one of two angular positions relative to an incident vapor flux, each workpiece possessing at least a first planar surface and a second planar surface, which apparatus comprises:

a. a support member;

b. a main frame rotationally mounted to the support member;

c. means for rotating the main frame relative to the support member from a first orientation to a second orientation;

d. a first set of stopping members and a second set of stopping members affixed to the main frame;

e. a plurality of workpiece holders freely pivotally mounted to the main frame in an unbalanced state such that, when the main frame is in the first orientation each workpiece holder abutts at least one stopping member of the first set, and when the main frame is in the second orientation each workpiece holder abutts at least one stopping member of the second set;

wherein the relative positioning of the elements is selected such that, when the main frame is in the first orientation, each workpiece holder comes to rest with the first planar surface of its workpiece perpendicular to the incident vapor flux and when the main frame is in the second orientation, each workpiece holder comes to rest with the second planar surface of its workpiece perpendicular to the incident vapor flux; whereby rotation of the main frame serves to simultaneously reorient each of the workpieces.

3,859,957
RELEASE FLUID APPLICATOR

Roger L. Larson, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

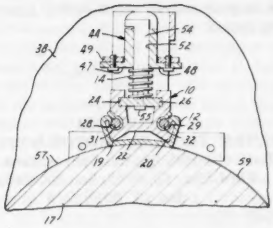
Filed Oct. 23, 1973, Ser. No. 408,538
Int. Cl. B05c *11/10*
U.S. Cl. 118—70 **3 Claims**

1. An applicator-cleaner for applying a release and off-set preventing fluid to the surface of a cylindrical pressure fixing roller and for cleaning developer powder therefrom, comprising:

a rigid frame having a length corresponding to the length of a said pressure fixing roller and formed with one surface having two longitudinal edge areas separated by a central recess extending the length of said frame,

a wicking blanket secured to said frame and stretched across said one surface of said frame to contact said two longitudinal edge areas thereof,

a predetermined quantity of a release and offset preventing fluid contained in said wicking blanket, and

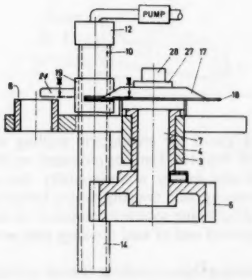


resilient biasing means for urging said one surface of said rigid frame toward contact with the pressure fusing roller to forcibly engage the portions of said wicking blanket over said longitudinal edge areas of said frame against the pressure fusing roller.

3,859,958
GLUE APPLICATOR, ESPECIALLY FOR ENDPAPER GLUING MACHINES

Paul Luscher, Vordemwald, Switzerland, assignor to Jos. Hunkeler AG Fabrik fur graphische Maschinen, Wikon, Switzerland

Filed Nov. 6, 1972, Ser. No. 303,877
Claims priority, application Switzerland, Nov. 5, 1971, 16089/71
Int. Cl. B05c *1/16*
U.S. Cl. 118—261 **5 Claims**



1. A glue applicator for applying glue to a workpiece comprising:

a reservoir comprising a generally inclined hollow elongated member having upper and lower ends through which glue may constantly flow having an inlet at the upper end of said member for the glue whereby the glue flows downwardly by gravity through the member along one side thereof; a first slot located in said one side of said member such that a portion of said slot extends below the surface of the glue when glue is flowing in said reservoir; and an outlet at the lower end of said member for that portion of the glue which is not removed out of said first slot;

means connected to said inlet of said reservoir for constantly flowing the glue therethrough in a shallow stream such that said stream of glue substantially covers said first slot while occupying only a small portion of the total inner volume of said reservoir, whereby approximately no static head is produced and substantially all the pressure exerted by the glue on said first slot is the dynamic pressure of the glue flowing past said first slot; and

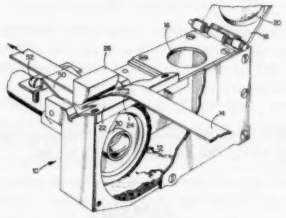
applicator means comprising a glue wheel, having an outer periphery, rotatably mounted externally of said reservoir with a portion of said outer periphery partially extending into said slot to communicate with said reservoir and in contact with the glue when glue is flowing therethrough, for transferring the glue from said reservoir to the workpiece, wherein the portion of said slot below the surface of the glue, when glue is flowing through said reservoir, is sufficiently small to prevent the glue from being forced out of said reservoir by the pressure from said dynamic head when said glue wheel is not rotating.

3,859,959

MAGNETIC TONER APPLICATOR

Owen J. Ott, Brookfield Center, and David W. Ginn, Newtown, both of Conn., assignors to Data Interface, Inc., Danbury, Conn.

Filed Apr. 5, 1974, Ser. No. 458,176
Int. Cl. G03g *13/06*
U.S. Cl. 118—637 **13 Claims**



1. In a magnetic printing system which includes a magnetic recording surface, means for applying toner to recorded areas of said surface and means for transferring such toner from said recording surface to a writing surface, toner supply apparatus comprising:

a housing containing a supply of toner and an aperture across which said recording surface is caused to move;

a rotary wheel of nonmagnetic material having a magnetic circumferential peripheral surface retaining a layer of toner thereon;

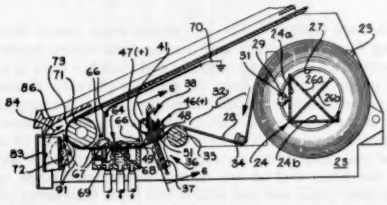
said toner layer being disposed in confronting relation to said aperture to contact said recording surface for attraction of toner to recorded areas thereof.

3,859,960

PRINTING MACHINE WITH ELECTROSTATIC WEB DEVELOPING APPARATUS

William A. Lloyd, San Jose, Calif., assignor to Versatec, Inc., Cupertino, Calif.

Division of Ser. No. 93,256, Nov. 27, 1970, Pat. No. 3,729,123. This application Feb. 26, 1973, Ser. No. 335,835
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 **1 Claim**



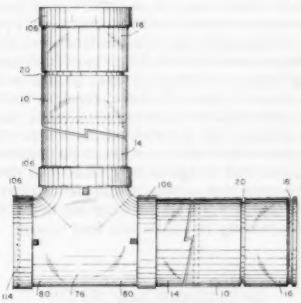
1. In an electrostatic printer of a type using a length of record material wrapped to form a supply roll to be fed along a path as a web through a printing station for electrostatically charging discrete portions of said web, apparatus for developing said portions comprising a supply reservoir of liquid toner material, a first elongate tray having relatively thin upwardly disposed walls extending substantially horizontally across the path of said web and lying beneath same, a second elongate tray containing said first tray and encircling the periphery of said first tray, said second tray having relatively thin upwardly disposed walls extending transversely of said web, said transversely extending walls being spaced well clear of the first named said walls to form a catch basin surrounding the first named tray to receive liquid toner material overflowing into the space defined between the walls of said first and second trays, a pump and connections for recirculating said toner material along a path defined from said reservoir to said first tray then overflowing into said second tray and returning to said reservoir, said first tray being disposed at a level relative to said web to carry the overflowing toner material into contact with said web portions to develop same, a pair of elongate wiper blades disposed in said second tray in spaced relation to each other and downstream of said first tray intermediate the confronting side walls of said first and second named trays, said blades each including a horizontal edge extending transversely across the path of said web and disposed to remove toner from the web and return the toner directly into said second tray, and a pressure member including a plurality of downwardly depending fingers serving to engage the back surface of said web to confine the travel of said web to move along a generally horizontal path while riding lightly across the upper edges of the walls of said first tray and said edges of said blades.

3,859,961

ANIMAL PATH CONNECTING SYSTEM

Allan H. Willinger, New York, and Albert J. Dinnerstein, Brooklyn, both of N.Y., assignors to Metaframe Corporation, East Patterson, N.J.

Continuation-in-part of Ser. No. 219,767, Jan. 21, 1972, Pat. No. 3,791,346. This application July 20, 1973, Ser. No. 381,034
Int. Cl. A01k *1/00*
U.S. Cl. 119—15 **24 Claims**



19. An animal path connecting system comprising a plurality of transparent tubular members each provided with open end portions defining axes substantially coextensive in a common plane, each tubular member comprising:

two mating half sections separable from each other at said common plane along lateral edges extending between adjacent sides of open end portions, the opposing lateral edges of associated sections substantially abutting against one another in the assembled condition of said tubular members; and

connecting means releasably cooperating with said end portions for connecting two mating half sections of a

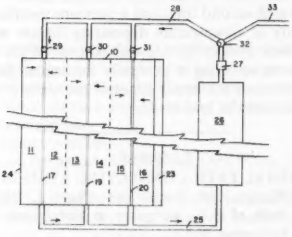
tubular member to one another, said connecting means further being adapted to secure two tubular members to one another, one of said opposing lateral edges being provided along the length thereof with a projecting pin, the other of said opposing lateral edges being provided with a hole adapted to receive said projecting pin, whereby said pin and said hole aid in locating said half sections prior to connecting by said connecting means.

3,859,962

SANITARY FLUSHABLE FLOOR FOR CATTLE CONFINEMENT FEEDLOTS

Ralph Kissinger, Jr., Fairfield, Nebr., assignor to Lennart G. Erickson, San Mateo, Calif., a part interest

Filed Aug. 3, 1973, Ser. No. 385,621
Int. Cl. A01k *01/00*
U.S. Cl. 119—28 **4 Claims**



1. An improved confinement feedlot adapted for inducing preselected movement patterns of cattle therein and efficient removal of manure wastes therefrom comprising: a plurality of solid, flat, inclined cattle supporting surfaces, a subfloor structure including channels for receiving wastes from said inclined surfaces, openings between lower ends of said inclined surfaces for communication with said channels, a feed or water trough positioned adjacent a section of said solid, flat inclined supporting surfaces and in communication with one of said channels of the subfloor structure, the slope of incline of said section adjacent said trough being greater than the slope of incline of the remaining sections of said inclined surfaces, and level step surfaces for at least the front feet of cattle while in position for removing food from said feed trough.

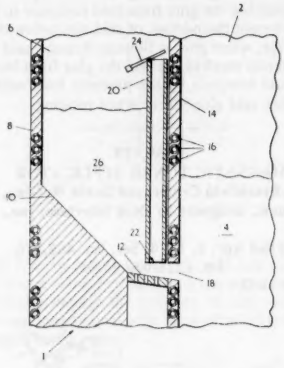
3,859,963

FLUIDISED BED COMBUSTORS

Alan Gregson Roberts, Dorking; Dennis Malcolm Wilkins, Purley, and Malcolm Arthur Wright, Cheltenham, all of England, assignors to Cool Industry (Patents) Limited, London, England

Filed Aug. 29, 1973, Ser. No. 392,551
Claims priority, application Great Britain, Sept. 1, 1972, 40544/72
Int. Cl. F22b *1/02*
U.S. Cl. 122—4 D **7 Claims**

1. A fluidised bed combustor including a combustor body, a container adjacent the combustor body, a common intervening wall interjacent the combustor body and the container, a number of communicating means defined in said wall and intercommunicating the container and the combustor body, and a number of material transfer ducts each extending within



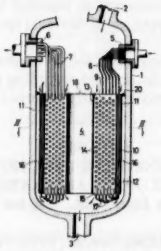
the container from an associated communicating means and terminating above the communicating means.

3,859,964

ONCE THROUGH BOILER

Moribumi Kozeki, Yachiyoshi, Japan, assignor to Mitsui Shipbuilding & Engineering Co., Ltd., Tokyo, Japan

Filed Oct. 15, 1973, Ser. No. 406,631
Int. Cl. F22b *1/06*
U.S. Cl. 122—32 **1 Claim**

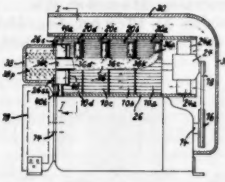


1. A once-through boiler, comprising drum means having heating fluid inlet means and heating fluid outlet means, a downcomer chamber and a helical coil chamber both in said drum means and one within the other, a plurality of downcomer pipes in said downcomer chamber, means for supplying water to the upper ends of said downcomer pipes, a plurality of helical coil pipes in said helical coil chamber, each of said helical coil pipes being supplied at its lower end with water from the lower end of one of said downcomer pipes, said downcomer pipes and said helical coil pipes both being positioned in heat-exchange relation to said heating fluid as it passes from said inlet means to said outlet means, each of said downcomer pipes being substantially smaller in diameter than the helical coil pipe which it supplies.

3,859,965
INTERNAL COMBUSTION ENGINE WITH SILENCING MEANS

Ernst Hatz, Ruhstorf, and Johann Schmuck, Feilnbach, both of Germany, assignors to Motorenfabrik Hatz KG, Ruhstorf, Germany

Filed May 8, 1973, Ser. No. 358,337
Claims priority, application Germany, May 8, 1972, 2222556; June 15, 1972, 7222447
Int. Cl. F01p *1/02*
U.S. Cl. 123—41.7 **4 Claims**

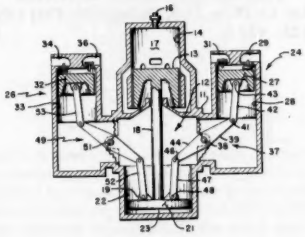


1. In an internal combusion engine having a row of cylinders, combustion air intake and discharge pipes, and a closed coolant air conduit system that includes an air fan, with which conduit system noise damping means are associated, the combustion air being introduced via an air filter, the improvements wherein the intake side of the conduit system includes a relatively long duct arranged along, laterally of and above the cylinder heads of the row of cylinders, the intake opening of the duct being at a first end of the row and the discharge end of the duct leading to the fan, said fan being arranged at the other end of said row and being connected with the air filter at the first end of the row by a passage defined by a guide plate lying laterally beside and along the row of cylinders, said filter receiving coolant air and leading it to the combustion air intake pipe of the engine, whereby the damping length on said intake side is at least as long as the row of cylinders, the discharge side of the conduit system including a flat channel disposed closely adjacent and along the row of cylinders and cylinder heads and extending downwardly along and adjacent the crankcase of the engine, said flat channel also surrounding the combustion exhaust pipe of the engine, such that the damping passage on the discharge side is approximately of the height of the engine.

3,859,966
LINEAR BALANCED FREE PISTON MACHINES

Anton Braun, 6421 Warren Ave., Minneapolis, Minn. 55435

Filed Feb. 16, 1973, Ser. No. 333,069
Int. Cl. F02b *71/00;* **F02d** *39/10*
U.S. Cl. 123—46 R **14 Claims**

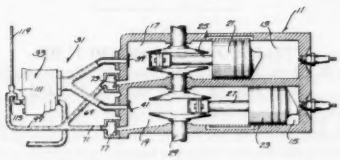


1. A balanced linear free piston machine comprising a first movable assembly having portions substantially all of which move together as a unit, said first movable assembly being supported for reciprocating movement with its center of gravity moving along an inner longitudinal axis of the machine, at least two movable counterbalancing assemblies each of which has portions substantially all of which move together as a unit, each counterbalancing assembly being supported for individual separate reciprocating movement with the respective centers of gravity of the counterbalancing assemblies moving along respective separate outer paths spaced from each other around said inner axis and first movable assembly, a separate synchronizing means mechanically and independently interconnecting each movable counterbalancing assembly with said first movable assembly for simultaneous synchronized movement of each movable counterbalancing assembly along its path in a direction having component vectors of such movement which are moving at all times in the opposite direction to the movement of the first movable assembly, at least one power cylinder stationarily mounted on said machine, one of the movable assemblies having a power piston portion supported for reciprocating movement in said power cylinder, and at least one of the other movable assemblies including a movable member of an energy absorbing device.

3,859,967
FUEL FEED SYSTEM FOR RECYCLING FUEL

Robert K. Turner, Waukegan, and Edgar Rose, Glencoe, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 228,775, Feb. 23, 1972, abandoned, which is a division of Ser. No. 17,729, March 9, 1970, abandoned. This application Dec. 26, 1973, Ser. No. 427,543
Int. Cl. F02b *33/04*
U.S. Cl. 123—73 A **13 Claims**



1. A two cycle internal combustion engine including a crankcase with a portion in which "drains" accumulate, a piston movable relative to said crankcase, a conduit communicating with said crankcase portion, valve means in said conduit preventing flow to said crankcase and permitting flow from said crankcase, and a carburetor including a fuel-air induction passage communicating with said crankcase, a fuel reservoir having a first inlet communicating with a fuel source and a second inlet communicating with said conduit, a fuel nozzle communicating with said air-fuel induction passage; fuel passage means communicating between said fuel reservoir and said nozzle and including a sharp-edged orifice, and means for controllably admitting air into said fuel passage means.

3,859,968
SUPERCHARGED ENGINES

Donald E. Stinebaugh, Post Falls, Idaho, assignor to Power Research & Development, Inc., Spokane, Wash.

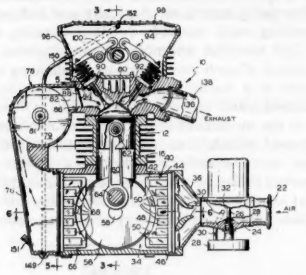
Continuation of Ser. No. 135,627, April 20, 1971, abandoned. This application Aug. 20, 1973, Ser. No. 389,992
Int. Cl. F02b *75/02;* **F02d** *33/02;* **F02n** *7/00*
U.S. Cl. 123—75 CC **28 Claims**

1. In a supercharged engine,
a block having a plurality of cylinders,
a plurality of pistons movable in the cylinders,
crankshaft means driven by the pistons,
the pistons having a predetermined displacement volume when reciprocated,
a reservoir having a volume at least several times as great as said displacement volume of the pistons,

supply means including supercharging means for supplying a fuel-air mixture under pressure to the reservoir,

a plurality of short intake passages connecting the reservoir to the cylinders,

a plurality of intake valve means for connecting the passages to the cylinders,



a plurality of manually controlled throttle means in the passages positioned close to the intake valves for controlling the flow from the reservoir to the cylinders,

the supply means including carburetor means supplying the fuel-air mixture and control means for keeping the proportions of fuel and air supplied by the carburetor means substantially constant.

3,859,969

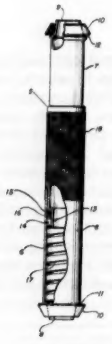
TELESCOPING PUSHROD TUBE

George B. Davis, Jr., 7512 Marbury Rd., Bethesda, Md.

Filed July 30, 1973, Ser. No. 383,482

Int. Cl. F01l *1/14*

U.S. Cl. 123—90.61 **5 Claims**



1. A pushrod inclosure of the tubular telescoping type including in combination, a pair of telescoping members, comprising an outer telescoping member and an inner telescoping member movable with respect to each other upon a common longitudinal axis, said telescoping members having a bearing surface bearing against each other as they move longitudinally along said axis, external flanges inwardly spaced from the outer or free ends of said telescoping members, annular gaskets arranged over the free ends of said telescoping members and operative in use to bear against said flanges to provide an oil seal therebetween and the free ends of said telescoping members, said inner telescoping member having a diametrically reduced inner tubular portion to form therebetween and said outer telescoping member on annular recess, gasket means arranged within said recess, spring means interposed between said gasket means and said outer telescoping member and operative in use to compress said gasket means in oil sealing relation between said telescoping members while urging the said telescoping members in opposite directions along said longitudinal axis.

3,859,970

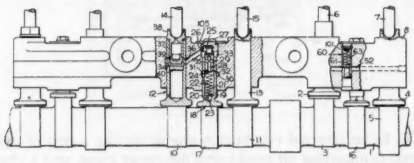
ENGINE RETARDER BRAKE

Alexander Dreisin, Oylmpia Fields, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jan. 22, 1973, Ser. No. 325,958

Int. Cl. F01l *9/02*; F02d *13/04*

U.S. Cl. 123—97 B **10 Claims**



1. In an internal combustion engine having means for operating the engine as an engine brake comprising, a cam shaft comprising an exhaust valve cam and an auxiliary cam angularly spaced on said cam shaft, means defining a combustion chamber, a valve in said combustion chamber, a valve operating mechanism between said exhaust valve cam on said cam shaft and said valve for normally operating said valve in response to rotation of said cam shaft when said engine is operating as an engine, a hydraulic actuator in said mechanism defining a hydraulic actuator chamber, a hydraulic pump defining a pumping chamber connected to said actuator chamber in said hydraulic actuator for expanding said hydraulic actuator and operating said valve in said combustion chamber, said auxiliary cam on said cam shaft driving said pump and providing early opening of said exhaust valve, a hydraulic system having a source of pressurized fluid selectively connected to said pump for supplying hydraulic fluid to said pump, control valve means selectively connecting said hydraulic system to said pump and supplying fluid to said pump for operating said valve in said combustion chamber as said hydraulic actuator is expanded to thereby operate said engine as an engine brake.

3,859,971

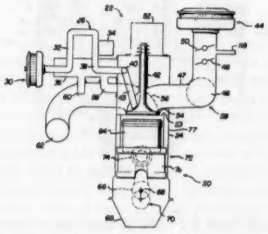
POWER TRANSMISSION SYSTEM AND METHOD

John T. Rauen, 6190 Lodewyck, Detroit, Mich. 48224

Filed Dec. 7, 1972, Ser. No. 313,144

Int. Cl. F02m *7/00*; F02b *29/00*; F16j *1/02*

U.S. Cl. 123—119 R **12 Claims**



1. An internal combustion engine, including at least one cylinder and a reciprocating piston for said cylinder, a multi-

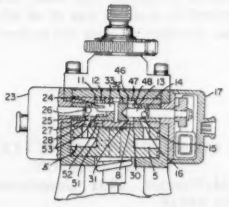
ple air induction means, air and fuel mixture inlet means, exhaust outlet means, said engine including a crank shaft operably connected to said piston by connecting means including a connecting rod, said induction means enabling said piston to be reciprocated at speeds from zero up to at least 6,000 feet per minute, said induction means also including an unheated air intake means for supplying to said cylinder substantially all of the air inducted by said engine, and a heated intake means including a carburetor means, for supplying to said cylinder all of the engine's fuel requirements and a small percentage of said inducted air, said heated intake means including a heating means adapted to heat the inducted air and fuel, said carburetor means adapted to supply fuel to said cylinder to form in said cylinder an ignitible and thereafter self-burning gaseous mixture comprised of about 4 percent fuel, piston guiding means in the form of a roller cross head assembly adapted to float said piston axially within said cylinder and free said piston from said connecting rod's tendency to thrust said piston onto said cylinder and thereby preventing said connecting rod forces from bearing said piston on said cylinder and thereby limiting said piston speed whereby said engine's potential power output also becomes limited, said roller cross head assembly including a roller rotatably received by said connecting rod, said piston including a head portion and an annular skirt portion extending toward said connecting rod, a cup-shaped piston guide member opening toward said piston and receiving said piston skirt and a pair of opposed guideways rotatably receiving said roller and extending in the reciprocating axis of said piston, whereby said piston guiding means enables said induction system to be used to its full potential in said engine's power output, and whereby the maximum power loss for a given size piston displacement engine resulting from the lean fuel-air mixture supplied to said cylinder to substantially eliminate air polluting emissions is offset by the increased engine speed enabled by said piston guiding means instead of increasing said engine's piston displacement to recover said power loss.

3,859,972

FUEL INJECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Edwin Ben Watson, Sidney, N.Y., and Harlan I. Fuller, Doylestown, Pa., assignors to The Bendix Corporation, Southfield, Mich.

Filed June 28, 1973, Ser. No. 374,733
Int. Cl. F02m *41/12*
U.S. Cl. 123—139 AR **6 Claims**



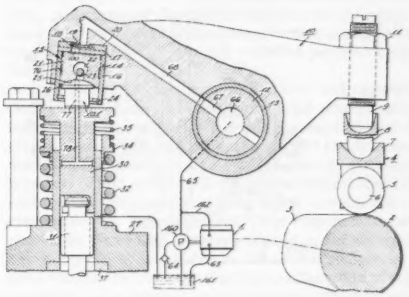
1. A fuel injection system for an internal combustion engine having a pumping unit with a plurality of pumping chambers, each chamber having an inlet port, a relief port, and an injection port, the injection port communicating with the engine during an injection period when the relief port is closed, means for supplying fuel to the pumping chambers through the inlet ports, means for pressurizing the fuel in the chambers, and a plurality of electromechanical valves associated with the pumping chambers, and means for providing electrical signals in timed relation to the engine for controlling one valve to close the relief port in a pumping chamber to start an injection period and for controlling another valve to open the relief port in the pumping chamber to end the injection period.

3,859,973

TIMING DEVICE FOR FUEL INJECTOR

Alexander Dreisin, Olympia Fields, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation of Ser. No. 212,338, Dec. 27, 1971, abandoned.
This application Sept. 13, 1973, Ser. No. 396,991
Int. Cl. F02m *39/00;* **F02d** *1/04*
U.S. Cl. 123—139 AQ **10 Claims**

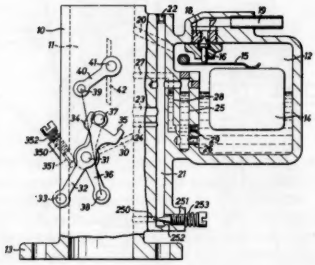


1. An automatic hydraulic timing mechanism for a fuel injection pump on an engine comprising, a fuel injection pump including resilient means and a plunger, said resilient means including a follower spring extending to a free length and an auxiliary spring biasing said plunger to its return position, said plunger defining initially a retarded position of said plunger when said auxiliary spring is expanded and initially an advance position of said plunger when said auxiliary spring means is contracted, a fuel injection pump actuating mechanism for driving said fuel injection pump, an expansible hydraulic timing cylinder including a check valve in said mechanism for transmitting the driving force to operate said fuel injection pump, means defining a variable volume chamber in said hydraulic timing cylinder for receiving hydraulic fluid, means in said hydraulic timing cylinder defining a fully contracted position with a minimum volume position of said variable volume chamber for retarding fuel injection, said auxiliary spring in said fuel injection pump continuously pressing against said hydraulic timing cylinder throughout the fuel injecting pumping cycle and expanding while biasing said hydraulic timing cylinder to the fully contracted position when pressure of hydraulic fluid in said variable volume chamber is below a predetermined pressure with operation below intermediate engine speeds, means in said hydraulic timing cylinder defining a fully expanded position for advancing fuel injection when hydraulic fluid in said variable volume chamber at a pressure above said predetermined pressure causes said auxiliary spring to contract with operation above intermediate engine speeds, a hydraulic system including a hydraulic pump connected through said check valve to said variable volume chamber of said hydraulic timing cylinder for expanding said cylinder when pressure of hydraulic fluid is above said predetermined pressure, means connected to the said hydraulic pump adapted for driving said hydraulic pump proportional to the engine speed to thereby provide retardation of fuel injection timing at cranking speed and automatic advance of fuel injection when operating above intermediate engine speeds when the hydraulic pressure is above said predetermined pressure.

3,859,974
COLD STARTING DEVICES FOR INTERNAL COMBUSTION ENGINES

Gray Ernest Donald Ross, Tring, England, assignor to The Zenith Carburetter Company Limited, Stanmore, Middlesex, England

Filed Mar. 12, 1973, Ser. No. 340,469
Claims priority, application Great Britain, Mar. 16, 1972, 12457/72
Int. Cl. F02m *1/04*
U.S. Cl. 123—179 G 15 Claims

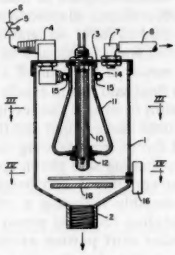


1. A cold starting device for an internal combustion engine, the cold starting device comprising a housing enclosing an auxiliary air supply passage, first and second throttle valve members disposed in the auxiliary air supply passage with the said second throttle valve upstream of the first throttle valve, resilient means for biasing said first throttle valve member towards the open position and the second throttle valve member towards the closed position, said first throttle valve member being arranged to be moved against the action of said resilient biasing means by air flowing past it to the engine into a position in which it restricts or prevents the flow of air past it to the engine and the second throttle valve member being arranged so as to tend to be moved against the action of said resilient biasing means to the open position by air flowing past it to the engine, at least one fuel supply orifice which opens into the portion of the auxiliary air supply passage which extends between the closed positions of said two throttle valve members whereby fuel can be drawn therethrough into said portion of the air supply passage by engine suction when said first throttle valve member is in the open position, and thermostatically operable control means for limiting movement of the two throttle valve members in the direction opposite to that in which they are biased by the resilient biasing means in accordance with engine temperature, the degree of movement of the two throttle valve members permitted by the thermostatically operable control means being increased as the engine temperature increases, said first throttle valve member being in the open position and said second throttle valve member being in the closed position at the commencement of engine starting and during the cranking period, and said first throttle valve member begins to close progressively and said other throttle valve member begins to open progressively when the engine commences to run under its own power, the progressive closing of said first throttle valve member and the progressive opening of said second throttle valve member continuing until the engine is running normally whereupon the supply of fuel into said portion of the auxiliary air supply passage ceases.

3,859,975
OIL REFINING DEVICE

David M. Hines, 3300 Paxton St., Harrisburg, Pa. 17104

Filed July 19, 1973, Ser. No. 380,728
Int. Cl. F01m *1/10*
U.S. Cl. 123—196 A 1 Claim



1. In an internal combustion engine oil refining device in which a receptacle containing an elongated electric heater has an oil inlet and a vapor discharge vent in its upper part and an oil oulet in its bottom, the vent being adapted to be connected with the inside of an internal combustion engine; a hollow non-metallic vaporizing unit encircling said heater for heating thereby, said vaporizing unit being an upwardly tapered flask provided with a hole in its bottom, said heater extending downwardly from the top of the receptacle and through said flask and hole, means mounted on the projecting lower end of said heater supporting the flask, and a tube in the receptacle connected to said oil inlet and forming a loop around the upper end portion of said flask provided with perforations for delivering oil thereto to maintain a downwardly flowing film of oil on the outer surface of said flask, said outer surface being characterized by draining free of oil whenever delivery of oil to it stops, whereby oil does not carbonize on said surface.

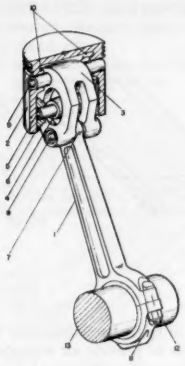
3,859,976
INTERNAL COMBUSTION ENGINE - COMBUSTION CONTROL PISTON

Edward M. McWhorter, 6931 Greenbrook Cir., Citrus Heights, Calif. 95610

Filed July 12, 1973, Ser. No. 378,432
Int. Cl. F02b *75/32*
U.S. Cl. 123—197 A 1 Claim

1. In an internal combustion engine, a piston, a piston slide slidably mounted inside said piston, a wrist pin extending transversly across said piston slide each end of which is pivotly mounted in said piston slide, a connecting rod having a small journal at one end which holds said wrist pin, below said small journal and positioned at one side of the longitudinal axis of said connecting rod a second small journal on said connecting rod, said second small journal holding a pin, the ends of said pin extending to both sides of said connecting rod, a connecting link being pivotly attached to each end of said pin, said connecting link holding a second pin also pivotly attached,

said second pin extending transversely across said piston and journaled at each end in said piston, at the opposite end of said



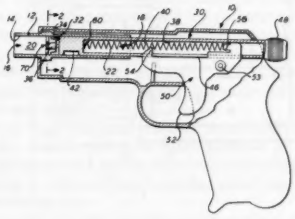
connecting rod a large journal for rotatively mounting on an internal combustion engine crankpin.

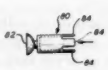
3,859,977

TOY GUN APPARATUS WITH BAFFLE IN BORE THEREOF AND PROJECTILE THEREFOR CONFIGURED TO EXTEND THROUGH THE BAFFLE

Arthur A. Lange, Oak Tree Ln., Rumson, N.J. 07760

Filed Nov. 15, 1973, Ser. No. 416,167
Int. Cl. F41b *11/00*
U.S. Cl. 124—14 **1 Claim**





1. In combination a toy gun apparatus and a projectile to be propelled by said toy gun apparatus and wherein said toy gun apparatus will not propel foreign objects not having the configuration of said projectile, comprising:

a projectile of generally cylindrical configuration provided with a suction cup at the front end thereof and provided with a plurality of spaced apart rearwardly extending members at the rear end thereof, and said projectile provided with an open end at the rear thereof and a closed end at the front thereof whereby air is received within said projectile;

means providing a bore having a forward open end, a forward portion, a rearward open end and a rearward portion;

generally cylindrical, longitudinally extending, spring operated plunger means provided with piston means at the forward end thereof for being admitted into the rearward open end of said bore and for being closely and slidably received within the rearward portion of said bore;

baffle means mounted in said bore intermediate said forward and rearward open ends thereof and said baffle means having a plurality of openings formed therein complementary in configuration to said plurality of spaced apart rearwardly extending members provided at the rear end of said projectile and said openings for loosely receiving said rearwardly extending members of said projectile;

upon said projectile being received within the forward portion of said bore with said rearwardly extending members being inserted firstly in said forward open end of said bore, said rearwardly extending members of said projectile extending through said openings formed in said baffle means and extending into said rearward portion of said bore;

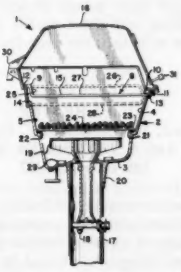
upon said plunger means being moved into said rearward portion of said bore by said spring, said piston means compressing air received within said rearward portion of said bore and within said projectile and said piston means directly mechanically engaging said rearwardly extending members of said projectile to propel said projectile out of said forward portion of said bore with a combination of compressed air and mechanical force imparted to said rearwardly extending members of said projectile upon being engaged by said piston means of said plunger; and upon foreign objects not having said configuration of said projectile being received in said forward portion of said bore, said foreign objects not extending through said openings formed in said baffle, said piston means being moved rapidly into said rearward portion of said bore said piston end of said plunger engaging said baffle means and having its movement stopped by said baffle means and being prevented from directly mechanically engaging said projectile whereby most of said foreign objects are not propelled out of said forward portion of said bore.

3,859,978

COOKING DEVICE

Donald R. Smith, Kansas City, Mo., assignor to Locke Stove Company, Kansas City, Mo.

Filed Sept. 17, 1973, Ser. No. 398,222
Int. Cl. A47j *37/07;* **F24b** *3/00*
U.S. Cl. 126—25 A **7 Claims**



1. A cooking device comprising:

a. a cooking compartment having integral bottom and upstanding spaced opposed walls;

b. heat supplying means positioned in a lower portion of said compartment;

c. certain opposed walls having portions forming ledges providing upwardly facing support surfaces with the wall

portion above a support surface being outward relative to the wall portion therebelow;

d. said ledges on the opposed walls being arranged to provide an upper support surface and a lower support surface on one of said opposed walls and first and second support surfaces on the other of said opposed walls, said first support surface being below said second support surface, and said upper and lower support surfaces having greater vertical spacing than said first and second support surfaces;

e. a food supporting grid having a center portion and opposed side members arranged to rest on support surfaces on ledges of the opposed walls, said side members being at different levels relative to said center portion;

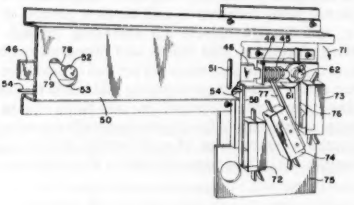
f. said ledges on said opposed walls and the spacing of said grid side members being vertically related for supporting the grid with the center section substantially horizontal at selected low, intermediate and high levels, whereby reversing and inverting and resting the side members on respective support surfaces permits the grid to be adjusted to the selected level.

3,859,979

OVEN DOOR LOCK

John W. Gilliom, Mansfield, Ohio, assignor to The Tappan Company, Mansfield, Ohio

Filed Feb. 1, 1974, Ser. No. 438,523
Int. Cl. F24c *15/04*
U.S. Cl. 126—197 **11 Claims**



1. An oven door lock, comprising latch means operable for locking the door in closed position; means for supporting said latch means to permit movement to and from locking engagement with the oven door; drive means for moving said latch means to and from such locking engagement; means for resiliently coupling said latch means to said drive means; and means for energizing said drive means to move said latch means to lock and to unlock the oven door.

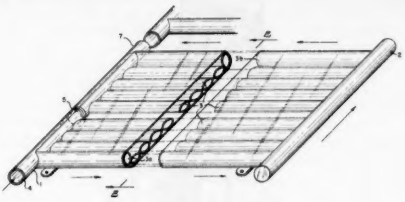
3,859,980

SOLAR HEATER

F. Robert Crawford, 316 Bayshore Dr., Osprey, Fla. 33559

Filed Aug. 6, 1973, Ser. No. 385,829
Int. Cl. F24j *3/02*
U.S. Cl. 126—271 **3 Claims**

1. A solar heater constructed of flexible material including an inlet and outlet manifold and a second fluid flow guiding manifold, a plurality of tubes of flexible material connecting said manifolds and being oval shaped in cross section, said tubes arranged in parallel relation and all of the tubes between the two outermost tubes being placed with their maximum diameters in a horizontal position to present a maximum surface to action of solar heat, said inlet and outlet manifold having an inlet thereto for receiving a cold fluid and an outlet at its other end for delivery of heated fluid from the tubes and a partition in the inlet and outlet manifold intermediate its ends for providing the desired direction of flow of fluid through the tubes, with the two outermost tubes of the plurality of parallel tubes connecting said manifolds being placed with their maximum diameters at right angles to the maximum diameters of the intermediate tubes and a transparent flexible envelope enclosing said heating unit and being held by said



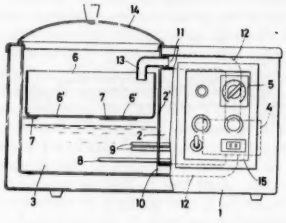
outermost tubes in spaced relation from the surfaces of the intermediate tubes to provide air insulating spaces between the tubes and the envelope to retard convection of heating from the tubes.

3,859,981

APPARATUS FOR SOLIDIFYING THE YOLK OF HEN'S EGGS

Chukichi Yoshida, Tokyo, Japan, assignor to Asahi Egger Company Inc., Tokyo, Japan

Filed Jan. 7, 1974, Ser. No. 431,102
Claims priority, application Japan, Jan. 13, 1973, 48-6742
Int. Cl. A47j *29/02*
U.S. Cl. 126—374 **3 Claims**

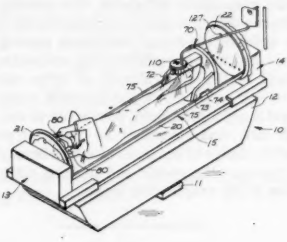


1. An apparatus for the solidification of yolks of hen's eggs, comprising in combination an outer receptacle having the interior thereof partitioned into an inner tank and a machine compartment, said inner tank being provided at an upper part with a hot water outlet and at a lower part with a hot water inlet respectively and said machine compartment incorporating therein a water feed pump adapted to draw in hot water through said inlet and discharge the hot water through said outlet; an inner container disposed in a freely detachable state at the upper portion of said inner tank, said inner container having an open upper side to admit hot water introduced through said outlet and incorporating a multiplicity of small holes bored through the bottom thereof; and a body of water in the lower portion of said inner tank, said body of water having a heater and thermostats disposed therein, whereby the body of water held in the lower portion of the inner tank is heated by the heater to a prescribed temperature, maintained at a constant temperature by virtue of the thermostats and, at the same time, supplied to and circulated through the interior of the inner container by means of the water feed pump.

3,859,982
APPARATUS FOR SUPPORTING PATIENT DURING ROTATION WITH PROVISION FOR FLUID ADMINISTRATION AND DISCHARGE

Robert L. Dove, University Heights, Ohio, assignor to Picker Corporation, Cleveland, Ohio

Filed Feb. 24, 1973, Ser. No. 326,375
Int. Cl. A61g *13/00*
U.S. Cl. 128—2 R **19 Claims**



1. A patient support system comprising:

a. a patient support means including a platform supported near opposite ends by a pair of end plates and defining a surface which, in cross section, has the configuration of an open curve for receiving portions of a patient's body;

b. air impervious means including a flexible air impervious member for positioning over said portions of the patient's body and for positioning around portions of said support means to define an evacuable chamber encompassing said portions, said member being provided with opening means for receiving the neck of the patient and for establishing a seal around the patient's neck to dispose the patient's head outside of said chamber;

c. said support means including head engaging means removably supported on one of said end plates for releasably engaging the patient's head, said head engaging means including support rod means having a pointed end region for puncturing said member upon being attached to said one end plate, and having means for sealing said member around the puncture regions produced when connection is made between said support rod means and said one plate;

d. means for sealing said member about such other portions of the patient and such other portions of said support means as extend outside said evacuable chamber, and for sealing portions of said member about the periphery of said end plates;

e. evacuation means for evacuating air from said chamber to create a pressure differential force acting on said portions of the patient's body to hold said portions of the patient's body against said support means.

3,859,983
ACUPUNCTURE LOCATING DEVICE AND NEEDLE GUIDE

Albert A. Dohring, and Grace H. Dohring, both of 24028 Union, Dearborn, Mich. 48124

Filed June 7, 1973, Ser. No. 368,037
Int. Cl. A61b *5/05, 17/34*
U.S. Cl. 128—2.1 C **7 Claims**

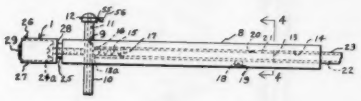
1. In an electrical locator to determine the areas on the body of a patient which may benefit from treatment by insertion of an acupuncture needle, with said locater included in an electrical circuit, and including,

an elongated handle formed of electrically non-conductive material,

a first hole extending transversely to the longitudinal axis of said handle,

an electrically conductive, elongated tubular electrode, received in said first hole to extend transversely of said longitudinal axis, and having sliding travel therein relative to said handle, for adjustment to desired positions thereon,

electrically conductive, yieldably resistant means carried by said handle to engage said tubular electrode to yieldably resist said sliding travel so as to retain the tubular electrode in assembly with said handle,



an electrically conductive wire, one end of which has electrical communication with said yieldably resistant means, a second electrode engageable with the body of a patient, and having electrical communication with the other end of said wire and being adapted to complete a circuit through said tubular electrode through the body of a patient,

a source of electrical power connected in said circuit, and a gage incorporated in said circuit to measure the characteristic of electrical current.

3,859,984
ULTRASONIC TRANSDUCER FOR FETAL MONITORING

Lawrence W. Langley, Ellwood City, Pa., assignor to Corometrics Medical Systems, Inc., Wallingford, Conn.

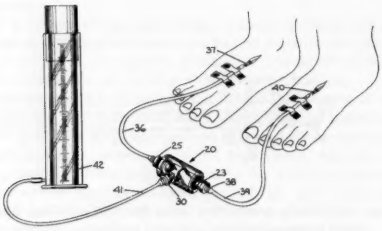
Filed Aug. 14, 1972, Ser. No. 280,571
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 Z **7 Claims**

1. An arrangement adapted to transmit and receive sonic energy comprising a housing member of insulating material having a facing surface, said housing member having a layer of conductive material adjacent and extending over said facing surface; first and second openings defined in said housing member, first and second non-conductive windows closing said openings and having front and rear surfaces, said front surfaces being essentially flush with said facing surface, first and second transducers mounted to the rear surface of said windows and spaced from and out of contact with said housing, means for connecting one of said transducers so that it may to be excited to transmit sonic energy, means for connecting the other of said transducers so that it may receive reflected sonic energy and means for connecting said conductive layer to ground.

3,859,985
ANGIOGRAPHY VALVE

Edgar O. Eckhart, Livingston, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed June 27, 1973, Ser. No. 373,978
Int. Cl. A61m *01/03*
U.S. Cl. 128—2.05 R 6 Claims

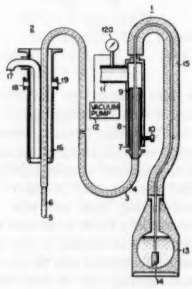


1. A valve adapted to be inserted in a predetermined flow line arrangement and designed to withstand high flow pressures comprising; an inner member having at least one axial bore and at least one inner annular groove communicating with each bore, sealing rings exteriorly mounted on the inner member to isolate the grooves, an outer member having a hollow radial extention for fluid flow therethrough and being mounted on the inner member so as to be rotatably and reciprocally movable with respect thereto so as to selectively place the outlet in communication with one of the grooves and pointed in any desired direction, the inner member being cylindrical in configuration and having an annular outer surface, each sealing ring being an O-ring externally mounted on the outer surface of the inner member, the outer member having an annular inner surface corresponding to the annular outer surface of the inner member and to engage in sealing relationship with respect to the sealing rings, the outer member being freely rotatable 360° about the inner member in sealed relationship with respect to the O-rings about the entire rotational path, and the inner and outer members being transparent to facilitate observation of the flow paths therethrough.

3,859,986
SURGICAL DEVICE

Jiro Okada, Kamakura, and Toshiyuki Mori, Tokyo, both of Japan, assignors to Jiro Okada, Kanagawa-ken, Japan and Olympus Optical Co., Ltd., Tokyo, Japan

Filed June 20, 1973, Ser. No. 371,935
Int. Cl. A61b *1/30, 17/36*
U.S. Cl. 128—007 11 Claims

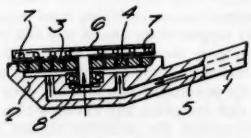


1. A surgical device for treating a diseased portion comprising an inner tube having one end dipped in a liquid refrigerant and the other end provided with a nozzle, an outer tube spaced from and surrounding at least the other end portion of the inner tube and the nozzle, said tubes being movably disposed relative to each other, the outer tube having a freezing tip at one end disposed at a distance from the nozzle to define an evaporating space therebetween, vacuum means for evacuating the space between the outer periphery of the inner tube and the inner periphery of the outer tube and the evaporating space, to introduce the liquid refrigerant from said one end of the inner tube to the evaporating space, whereby the refrigerant is evaporated in said evaporating space to cool said freezing tip, the evaporated refrigerant then passing through the space between the inner and outer tubes to thermally insulate from the ambient the liquid refrigerant passing through the inner tube, said vacuum means being connected to an outer sleeve fixed to the inner sleeve, an inner sleeve coaxially inserted in said outer sleeve and movable along its axis, one end of said inner sleeve being connected to the other end of said outer tube, and a member for fixing the position of the inner sleeve relative to the outer sleeve, whereby to adjust the distance between the nozzle and freezing tip to control the dimensions of the evaporating space.

3,859,987
MIRROR, PARTICULARLY FOR EXAMINATION OF CAVITIES, FOR EXAMPLE, SURGICAL MIRRORS OR DENTAL MIRRORS

Harald Holstad, Bragernes torv 2a, 3000, Drammen, Norway

Filed Apr. 13, 1973, Ser. No. 350,990
Claims priority, application Norway, Apr. 17, 1972, 1320/72
Int. Cl. A61b *1/00*
U.S. Cl. 128—21 6 Claims



1. A self-cleaning surgical or dental mirror for examination of cavities comprising a mirror element arranged in a holder which is connected to a hollow handle, the surface of said mirror element being provided with a means for keeping said surface clean, said means including a plurality of apertures through which a gaseous medium supplied externally through said hollow handle can be blown.

3,859,988
OPEN LEAD TESTING SYSTEM FOR EEG

Cecil C. Lencioni, Jr., Chicago, Ill., assignor to Beckman Instruments, Inc., Fullerton, Calif.

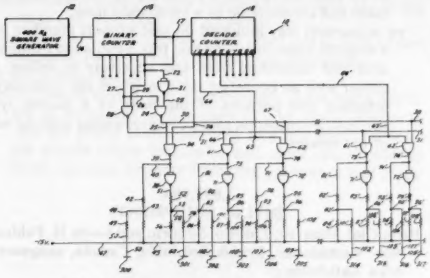
Filed Apr. 30, 1973, Ser. No. 355,768
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.1 B 5 Claims

1. A test system for identifying open circuit electrodes of a multi-electrode EEG system during patient testing comprising pulse generating means for producing an alternating electrical signal,

counter means responsive to the alternating electrical signal for producing first and second pulse signals,

logic ciruit means responsive to said first and second pulse signals for selectively producing a plurality of identical test signals each corresponding to a different EEG elec-

trode, said test signals occurring at different times within a predetermined test sequence, and

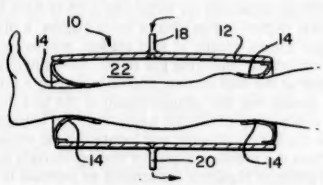


circuit means for conducting each test signal to said corresponding EEG electrode.

3,859,989
THERAPEUTIC CUFF

Theodore E. Spielberg, 619 Washington St., Wellesley, Mass. 02181

Continuation-in-part of Ser. No. 321,313, Jan. 5, 1973, abandoned. This application Feb. 15, 1973, Ser. No. 332,703
Int. Cl. A61h *1/00*
U.S. Cl. 128—24 R **12 Claims**



1. A therapeutic cuff for an animal body comprising

A. a relatively inflexible casing for positioning over a body portion and forming a chamber therewith,

B. at least one thin, flexible, body conforming, adherent, elongated sheet having a first end thereof circumferentially attached to said casing and having a second end thereof extending radially inwardly from said casing for engagement along a substantial area, intermediate said ends, with a body positioned within said casing to thereby form a circumferentially extending fluid tight sealing flap surrounding said body portion and isolating the interior of said chamber from the exterior thereof, the diameter of said flap at its ends and all portions therebetween being greater than that of the body portion it contacts whereby said flap exerts substantially no force of its own against said body portion,

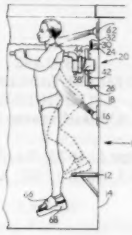
C. means forming a circumferentially extending closed auxiliary chamber on an interior wall of said casing and having a deformable wall in contact with a surface of said flap opposite the surface in contact with said body portion, said chamber being pressurized to substantially atmospheric pressure to thereby exert minimal force against said flap and said body portion when the pressure within said casing is greater than atmospheric pressure and to exert a sealing force against said flap and body portion when the pressure in said chamber is less than atmospheric, and

D. means on said cuff for pressurizing said chamber.

3,859,990
THERAPEUTIC EQUIPMENT

Peter J. Simon, 1065 Talbot St. North, London, Ontario, Canada

Filed June 11, 1973, Ser. No. 368,758
Int. Cl. A61h *9/00*
U.S. Cl. 128—66 **4 Claims**



1. Apparatus for applying traction to the spine of a user while immersed in water comprising in combination:

a. a bath tank capable of holding sufficient water to completely immerse a human body standing upright therein and having side and bottom walls thereon;

b. a pair of spaced apart support members extending outwardly from an upper side of one of said side walls of said bath tank;

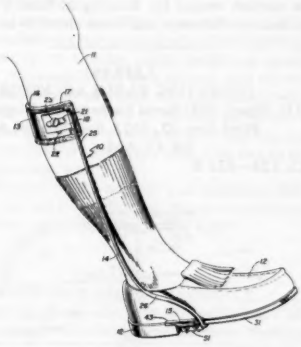
c. individual bolster means on each support member to suspend said user by his arms in a substantially upright posture in said bath tank of water;

d. weight means attachable to the lower extremities of said user to decrease the effect of buoyancy of the water in said bath.

3,859,991
LEG BRACE

Peter Theodores, Dudley, Mass., assignor to Sudbury Engineering, Sudbury, Mass.

Continuation of Ser. No. 229,101, Feb. 24, 1972, abandoned. This application Nov. 2, 1973, Ser. No. 412,346
Int. Cl. A61f *3/00*
U.S. Cl. 128—80 E **4 Claims**



1. A leg brace, comprising:

a. a band adapted to be attached to the calf of the user,

b. a clamp consisting of two parts each having a flange for engagement with an edge of the sole of the shoe of the user and of means for drawing the parts together to clamp the sole between the flanges, and

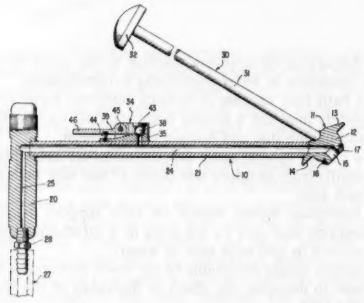
c. a pair of bowed rods of springy material each having a first end attached to the band and a second end fixed to the clamp, so that the band and clamp are resiliently connected, the first end being attached to the band by a connection structure which rigidly fixed the position of the first end with respect to the band and said connection structure including means which allows selective adjustment of the position either longitudinally or transversely of the rod.

3,859,992

VACUUM-OPERATED ACETABULAR CUP HOLDER AND POSITIONER

Harlan C. Amstutz, 433 Burlingame Ave., Los Angeles, Calif. 90049

Filed June 6, 1973, Ser. No. 367,695
Int. Cl. A61b *17/00;* **A61f** *5/04*
U.S. Cl. 128—92 E **8 Claims**



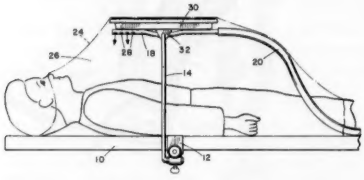
1. In an instrument for holding and positioning an acetabular cup during anthroplastic surgery, the improvement comprising a head member having a distal tip portion contoured to mate with the interior surface of said cup and a flange extending radially therefrom, said flange having a planar surface to locate said cup upon said head member, a resilient member mounted on said tip for forming a seal of at least partial air-tightness with the surface of the cup interior and vacuum-forming means including means forming a fluid pathway between a vacuum port formed in said head member and remote suction means for forming at least a partial atmospheric vacuum between said head member and said cup.

3,859,993

OPERATING TABLE ACCESSORY

Daniel G. Bitner, 1032 Santa Barbara, San Diego, Calif. 92107

Filed Aug. 27, 1973, Ser. No. 391,643
Int. Cl. A61m *15/00*
U.S. Cl. 128—132 R **6 Claims**



1. An accessory for an operating table having two opposite sides comprising:

a support member having attachment means for direct and rigid mounting thereof to the opposite sides of an operating table and defining a transverse arch over a forward portion of an operating table to which the support member is mounted;

a ventilation fitting mounted on said support member so as to be near the face of a patient lying on said operating table and connectable to a ventilation hose;

an instrument tray mounted on said support member; and

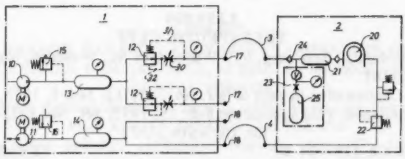
a surgical drape overlying said tray, ventilation fitting and arch and depending from said accessory to define, together with an operating table to which the accessory is attached and portions of the body of a patient lying thereon, a ventilation space communicating with the nose of the patient.

3,859,994

DIVING EQUIPMENT

Hans Olof Almqvist, Lidingo, Sweden, and Gosta H. Fahlman, New Westminster, British Columbia, Canada, assignors to AGA Aktiebolag

Filed June 29, 1972, Ser. No. 267,472
Int. Cl. A61m *16/00*
U.S. Cl. 128—142.3 **5 Claims**



1. A diving apparatus for supplying a diver with breathing air to great depths comprising: a main station, a diver's helmet, a gas source means at said station, means including a supply conduit for supplying gas to the diver's helmet, a vacuum pump at the said station, means including a return conduit for connecting the vacuum pump to the said diver's helmet for evacuating exhalation gases from the helmet, control means in the supply conduit and located at the station downstream from the pressure regulator and operatively connected with the pressure regulator for sensing an increase in pressure as the diver moves downstream with respect to the station and a decrease in pressure in the supply conduit as the diver moves upward with respect to the station resulting in an adjustment at the pressure regulator so as to supply a higher or lower gas pressure, respective of the diver's movement with respect to the station, into the supply conduit, thereby maintaining constant the absolute rate of gas flow of breathing gas through the supply conduit for maintaining constant the absolute rate of gas flow of breathing gas through the supply conduit and a vacuum-pressure regulator means in the return conduit near the helmet for regulating the sub-atmospheric pressure in the return conduit to keep the resistance of the diver to exhalation independent of the sub-atmospheric pressure generated by the said vacuum pump at different depths of the diver relative to the station.

3,859,995

BREATHING ASSIST APPARATUS

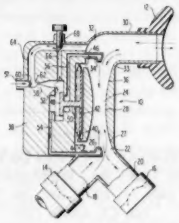
John R. Colston, Annapolis, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed July 2, 1973, Ser. No. 376,003
Int. Cl. A61m *16/00*
U.S. Cl. 128—145.8 **13 Claims**

1. Breathing assist apparatus in a system having a breathing input/output device coupling the respiratory system to a source of breathing gas, comprising in combination:

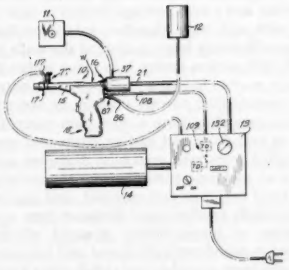
a reversible jet pump, having a pair of opposed aspirators each including a supply nozzle, said supply nozzles being directed toward one another and respectively located at either end of a converging-diverging throat section in-

cluding a common relatively narrow intermediate portion, and flared end portions;
means coupling one end portion of said jet pump to said input/output device;
input means coupling said source of breathing gas to the other end portion of said jet pump;
output means also coupled to said other end portion of said jet pump for removing exhaled gases therefrom;
a gas power source;
valve means having bi-stable operating states being operable to alternately couple each of said supply nozzles to said gas power source whereby in a first operating state the supply nozzle located at said other end of said jet pump operates to pump breathing gas toward said input-



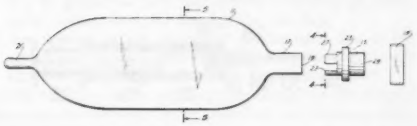
/output device through said thraot section and in a second operating state said supply nozzle located at said one end of said jet pump operates to pump exhaled gas to said output means through said throat section;
means responsive to the pressure differential between each end portion of said jet pump in the region of said supply nozzles for actuating said valve means and comprising a pressure chamber including a diaphragm, in parallel relationship to said reversible jet pump, dividing said pressure chamber into two parts and additionally including a first channel coupling the region at said one end of said jet pump to one part of said chamber and a second channel coupling the region of the other end of said jet pump to said second part of said chamber; and
means coupling said diaphragm to said valve means.

3,859,996
MULTI-DOSE INJECTOR
A. Robert Mizzy, New York, N.Y., and Vito L. Pierannunzi, Clifton Forge, Va., assignors to Mizzy, Inc., Clifton Forge, Va.
Filed July 18, 1973, Ser. No. 380,357
Int. Cl. A61m *5/30*
U.S. Cl. 128—173 H **17 Claims**



1. An injector apparatus comprising, in combination, a body portion, an ejector nozzle mounted at one end of said body portion including a discharge orifice, an exit passage in said body portion leading to said orifice, a liquid reservoir, intermittently actuatable powerized discharge means for expelling liquid from said reservoir into said exit passage for ejection of a given amount of liquid out said orifice, trigger means for actuating said discharge means, said trigger means including a slide member mounted on said one end of said body portion adjacent said orifice for reciprocal movement in the direction of said discharge orifice, said slide member including a trip portion projecting forwardly beyond said orifice to touch the surface to be injected, resilient means biased between said slide member and said body portion for urging said slide member to a forward position, said slide member being shiftable rearwardly from said forward position against the biasing pressure of said resilient means by abutment of the trip portion against the surface to be injected, and sensing means for actuating said discharge means in response to a predetermined rearward movement of said slide member.

3,859,997
RESERVOIR BAG FOR ANESTHESIOLOGY
William L. Douma, West Patterson, N.J., and Robert A. Gandi, Greenwich Village, N.Y., assignors to Becton, Dickinson and Co., Rutherford, N.J.
Continuation of Ser. No. 185,077, Sept. 30, 1971, abandoned. This application July 9, 1973, Ser. No. 377,265
Int. Cl. A61m *16/00*
U.S. Cl. 128—202 **2 Claims**

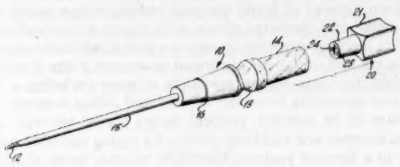


1. A low cost disposable two-piece reservoir bag, comprising:
an integral single-piece thin walled, substantially uniform thickness, a leak-proof bag of a flexible elastomeric rubber material, the bag elasticity and thinness cooperating in rendering the bag expandable under over-pressure conditions thereby avoiding exposure to the patient of excessive pressures, the bag being of low gas permeability and having a neck with an opening formed therein in communication with the interior of the bag, the bag having good tactile sensitivity and being conductive throughout all surfaces thereof;
conductive adapter means fixedly positioned within the neck and including a portion extending from said bag, the adapter having an annular radial projection extending therefrom intermediate the ends thereof, and the rubber neck being elastically stretched into engagement with the adapter over the projection to thereby provide a tight sealed interengagement between adapter and bag and to provide a continuous conductive path from end to end of the two-piece bag; and
projections formed on the adapter and extending into the interior of the bag for preventing obstruction of the opening when the bag is displaced to one side.

3,859,998
INTRAVENOUS NEEDLE ASSEMBLY
Joseph John Thomas, Somerville, and William Smith, Califon, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.
Filed June 5, 1972, Ser. No. 259,886
Int. Cl. A61m *5/00, 1/00*
U.S. Cl. 128—214.4 **5 Claims**

1. An intravenous needle assembly comprising: a hollow pointed needle; a hub secured to the proximal end of said needle, said hub having a transparent blood-detecting chamber; and a plug removably secured in said chamber, said plug

having an axial opening therethrough and a thin diaphragm disposed across said opening, said diaphragm having a slit



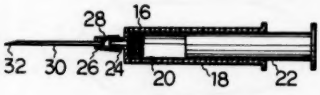
formed therein for permitting the passage of air from said chamber, the amount of material in said diaphragm being substantially unchanged by the formation of said slit therein.

3,859,999

FILTER AND NEEDLE ASSEMBLY INCORPORATING THE FILTER

Soji Ishikawa, Tokyo, Japan, assignor to Ishikawa Manufacturing Co., Tokyo, Japan

Filed May 31, 1973, Ser. No. 365,738
Claims priority, application Japan, June 6, 1972, 47-55595
Int. Cl. A61m *5/32*
U.S. Cl. 128—218 N **4 Claims**



1. A medical administering needle assembly comprising a first bored member having a longitudinal bore for conducting fluid therethrough, a second bored member disengageably fitted at one end thereof on said first bored member and having a longitudinal bore extending throughout its length and in communication with said bore in the first bored member, a needle having one end securely connected to the other end of said second bored member and having an axial bore extending throughout its length and in communication with the bore in said second bored member, and a filter which comprises a wad of at least one length of continuous filament of synthetic resin substantially uniformly entwined into wad form and located in a passageway formed between the axially aligned first and second bored members, said filament having a denier number ranging from about 75 to about 150 and said wad of the filament having a density in a range of from about 0.8 gram/cm^3 to about 1.6 gram/cm^3.

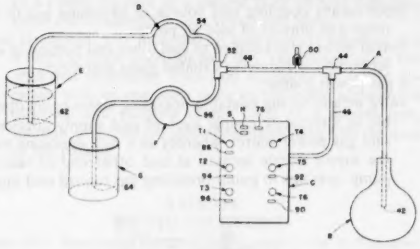
3,860,000

MEDICAL APPARATUS AND METHOD FOR FEEDING AND ASPIRATING

John A. Wootten, South Euclid, and George S. Rives, Sheffield Lake, both of Ohio, assignors to Lear Siegler Inc., Elyria, Ohio

Filed July 12, 1973, Ser. No. 378,408
Int. Cl. A61m *1/00*
U.S. Cl. 128—230 **20 Claims**

1. In an apparatus for feeding a solution to a patient's stomach, said apparatus including tube means having tube opening means for positioning within a patient's stomach and feed means connected to said tube means for feeding a solution through said tube and tube opening means, the improvement comprising; pressure sensing means for sensing pressure within the patient's stomach to signal an overpressure condition to stop said feed means, means for automatically stopping said feed means in response to said pressure sensing means sensing such overpressure condition, and means for delaying stoppage of said feed means until said pressure sensing means



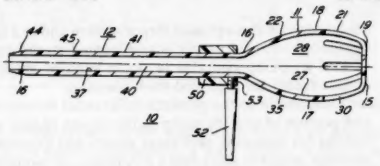
senses such overpressure condition for a predetermined period of time.

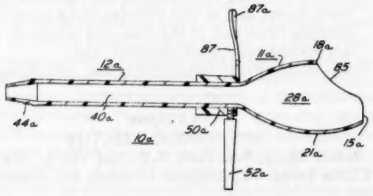
3,860,001

VAGINAL SUCTION DEVICE

Simon Levin, Rose Valley Rd., Wallingford, Pa. 19086

Filed July 31, 1973, Ser. No. 384,237
Int. Cl. A61m *1/00*
U.S. Cl. 128—276 **13 Claims**





1. A vaginal suction device for insertion into the vagina during a surgical procedure comprising

an outer bulbous shaped body portion having an inner chamber and a flow passage portion in fluid communication with said inner chamber, said outer bulbous shape being sufficiently large to distend the walls of the vagina when said suction device is in place within the vagina,

said body portion having a front end and a rear end extending into said flow passage portion, an outer front curved section extending from a maximum outer diameter section to said from end and an outer rear curved section extending from said maximum diameter section to said rear end, said maximum diameter section being closer to said front end than said rear end, said rear end having a substantially smaller outer diameter than said front end, a series of longitudinally directed slit-like openings formed in said front section and said front end extending into said inner chamber and radial with a longitudinal axis of said body portion, said openings being sufficiently large to allow passage therethrough into said first inner chamber of said blood and secretions whereby upon application of suction to a rear end of said tubular portion and with said body portion positioned in the deepest part

of the vagina, blood and secretions are suctioned through said opening into said inner chamber and then through said flow passage portion.

10. A vaginal suction device for insertion into the vagina during a surgical procedure comprising

an outer bulbous shaped body portion having an inner chamber and a flow passage portion in fluid communication with said inner chamber, said outer bulbous shape being sufficiently large to distend the walls of the vagina when said suction device is in place within the vagina,

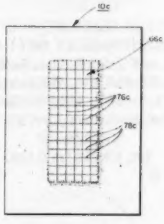
said body portion having a front end and a rear end extending into said flow passage portion, an outer front curved section extending from a maximum outer diameter section to said front end and outer rear curved section extending from said maximum diameter section to said rear end, said maximum diameter section being closer to said front end than said rear end, said rear end having a substantially smaller outer diameter than said front end,

a single opening cut out of both said front curved section and said front end to form a single frontal opening, said rear curved section having no opening, said frontal opening being cut out starting from said front end curving upwardly along the sides of said frontal opening until said frontal opening is adjacent said maximum diameter section, whereby upon application of suction to a rear end of said tubular portion and with said body portion positioned in the deepest part of the vagina, blood and secretions are suctioned through said single frontal opening into said inner chamber and then through said flow passage portion.

3,860,002
ABSORBENT ARTICLES

Charles G. Kolbach, Media, Pa., assignor to Scott Paper Co., Delaware County, Pa.

Filed May 14, 1973, Ser. No. 360,124
Int. Cl. A61f *13/16*
U.S. Cl. 128—284 **12 Claims**

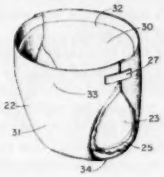


1. An absorbent article suitable for use as a disposable diaper and the like; said absorbent article comprising a unitary assemblage of randomly arranged fibers in the form of a web, said web having a transverse dimension defined between spaced, elongate side edges and an elongate dimension defined between spaced end edges; a medial portion of said web having a greater basis weight and greater average thickness than flanking end and side portions thereof for establishing a step configuration in a upper surface of said web in both the elongate and transverse directions; adhesive means on said upper surface of said web for bonding together exposed surface fibers in said upper surface to provide an abrasion resistant, non-pilling, facing layer, and to aid in maintaining the structural integrity of said web and stabilizing means for stabilizing a lower surface of said web; said upper surface being adapted to be positioned in contact with a wearer with the medial portion of the web in the perineal region, the flanking side portions about the thigh regions, and the flanking end portions about the front and back regions.

3,860,003
CONTRACTABLE SIDE PORTIONS FOR DISPOSABLE DIAPER

Kenneth Barclay Buell, Cincinnati, Ohio, assignor to The Procter & Gamble Co., Cincinnati, Ohio

Filed Nov. 21, 1973, Ser. No. 418,147
Int. Cl. A61f *13/16*
U.S. Cl. 128—287 **17 Claims**



1. In an integral disposable diaper having a backsheet and a semi-rigid absorbent body superposed on and associated with the backsheet, an improvement, comprising:

a. a flexible side flap extending outwardly from and along each lateral edge of the absorbent body, the side flap being in the crotch area of the diaper,

b. an elastic member secured to the side flap in an elastically contractable condition, the elastic member being effective to gather the side flap thereby providing an elasticized contractable line through the side flap;

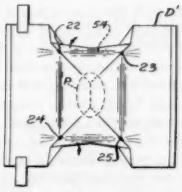
c. the portion of the elasticized contractable line in the crotch area being spaced outwardly from the lateral edge of the semi-rigid absorbent body at leat ¾ inch;

whereby effective elastic side flaps are formed on the integral diaper and the side flaps being compliant and forming effective seals about an infant's leg.

3,860,004
DISPOSABLE DIAPER

Ernst Daniel Nystrand, Green Bay, Wis., assignor to Paper Converting Machine Co., Green Bay, Wis.

Continuation-in-part of Ser. No. 297,750, Oct. 16, 1972, abandoned, and Continuation-in-part of Ser. No. 373,247, June 25, 1973, abandoned. This application Oct. 5, 1973, Ser. No. 404,037
Int. Cl. A61f *13/16*
U.S. Cl. 128—287 **1 Claim**



1. A generally rectangular disposable diaper comprising an outer impermeable sheet, a layer of liquid absorbing material and an inner liquid permeable sheet all united perimetrically, said diaper having a central transversely extending interrupted line of compression whereby the diaper is adapted to be folded on itself to provide a crotch-forming portion in the middle of said interrupted line of compression,

said line having a segment extending in from each longitudinal edge with each segment terminating short of the crotch-forming portion of the diaper,

a pair of inwardly convergent foreshortened lines of compression associated with each of said segments and disposed at about 45° relative thereto, each of said conver-

gent lines of compression extending in from each longitudinal edge but terminating short of the crotch-forming portion of the diaper and short of the inner end of its associated segment and cooperating with said associated segment to provide a relatively rounded, unstressed crotch-forming portion, said diaper prior to installation on an infant being folded along said interrupted line and having an outfold along each line segment and an infold in said crotch-forming portion, and further having an infold along each convergent line whereby said diaper is relatively thin for packaging,

and means adhering said inner sheet together adjacent each longitudinal edge but spaced inwardly therefrom on opposite sides of each of said convergent lines of compression to provide a rounded leg outfold in said diaper when applied to the body of an infant, said leg outfold extending generally along an imaginary line connecting a pair of adhering means adjacent one longitudinal edge.

3,860,005

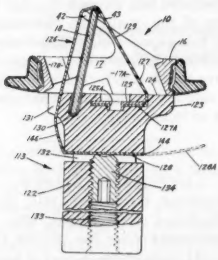
COLLET FOR HOLDING HEART VALVE

Lawrence Anderson, and Bruce D. Bentzen, both c/o Medical Incorporated, 5200 W. 78th St., Minneapolis, Minn.

Continuation-in-part of Ser. No. 287,420, Sept. 8, 1972, Pat. No. 3,828,787. This application Sept. 5, 1973, Ser. No. 394,482

Int. Cl. A61b *17/00*

U.S. Cl. 128—303 R **20 Claims**



1. A collet for holding a heart valve having a base, a passage through the base, a disc positionable in the passage for movement to open and closed positions, and arm means secured to the base cooperating with the disc to retain the disc in assembled relation with the base comprising: a body having a head, said head having a portion engageable with one side of the base, a groove for accommodating a portion of the disc to hold the disc in the open position, an elongated means having a first portion secured to said head, means located in said head to secure the first portion to said head, said elongated means extended through the passage and positionable over the arm means and disc, and means to secure a second portion of the elongated means to the body to hold the elongated means in position over the arm means and disc.

3,860,006

SUPRAPUBIC CATHETER SYSTEM USING AN INTERNAL STYLET

Bhupendra C. Patel, Elgin, Ill., assignor to The Kendall Co., Wolpole, Mass.

Filed June 25, 1973, Ser. No. 372,797

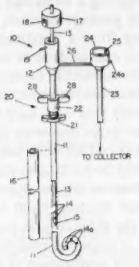
Int. Cl. A61b *17/34;* **A61m** *25/00*

U.S. Cl. 128—347 **20 Claims**

1. Apparatus for suprapubic catheterization comprising:

a flexible catheter tube extending out from a catheter hub having an opening in the top thereof in communication with said tube, said catheter tube having a particular and predetermined internal diameter, and having at least one opening thereon at and end portion thereof opposite from said catheter hub;

a hollow elongated stylet positioned within said catheter tube, said stylet having an external diameter slightly less than said internal diameter of said catheter tube and having a point on the closed end portion thereof protruding from said catheter tube, said stylet having at least one opening on the end portion thereof closest said point and being in congruous relationship with said at least one opening on said catheter tube;



a flexible drainage tube extending out from an interconnecting cap that can be fitted over the opening on the top of said catheter hub thereby permitting the flow therethrough of fluid; and

a slidable locking mechanism disposed on said catheter tube for stabilizing the catheter and for use in securing the catheter to a body, said locking mechanism including a rigid plastic male part that tapers in to squeezably fit into a rigid plastic female part having a tapered opening in the bottom thereof that is congruent with and is substantially the same size as said tapered male part having at least one slit on said tapered portion thereof.

3,860,007

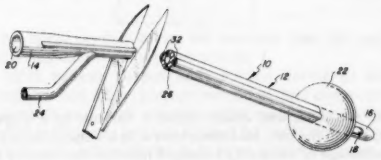
CATHETER WITH SAFETY DEFLATION MEANS

William J. Binard, and John F. Dye, both of Barrington, Ill., assignors to The Kendall Co., Walpole, Mass.

Filed Feb. 20, 1973, Ser. No. 333,926The portion of the term of this patent subsequent to Apr. 10, 1990, has been disclaimed.

Int. Cl. A61m *25/00*

U.S. Cl. 128—349 B **5 Claims**



1. A catheter, comprising:

a shaft having a proximal end, a distal end for insertion into a body cavity, a drainage eye adjacent the distal end of the shaft, and a main lumen extending from the drainage eye to the proximal end of the shaft for draining liquid from the body cavity;

an inflatable retention balloon adjacent the distal end of the shaft for retaining the shaft in the cavity;

an inflation lumen extending between the inside of said balloon and adjacent the proximal end of the shaft;

valve means for controlling inflation and deflation of said balloon through said inflation lumen; and

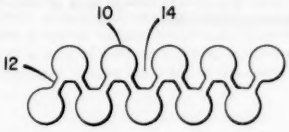
at least one separate deflation lumen communicating between the balloon and adjacent the proximal end of the

shaft, with the proximal end of said deflation lumen being closed and spaced from the proximal end of the catheter shaft, said deflation lumen having an outer wall defining an outer surface of the catheter shaft, and with said proximal end of the deflation lumen being separated from communication with the inflation lumen, whereby the balloon may be deflated through the deflation lumen by severing the catheter shaft and deflation lumen adjacent the proximal end of the shaft when the inflation lumen is obstructed.

3,860,008
FLAT DRAIN

Kenneth G. Miner, Homer Township, Midland County; Thomas D. Talcott; James B. Davidson, both of Midland, all of Mich., and David B. Batdorf, Thousand Oaks, Calif., assignors to Dow Corning Corporation, Midland, Mich.

Filed Oct. 3, 1973, Ser. No. 402,924
Int. Cl. A61m *27/00*
U.S. Cl. 128—350 R **4 Claims**

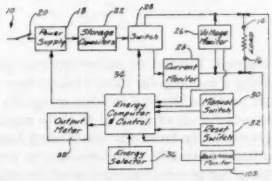


1. A surgical drain comprising a series of rods lying on two horizontal planes, the rods of one plane staggered in relation to the rods on the other plane, the rods on the same plane in spaced relation to each other and the rods on the plane connected to adjacent rods on the other plane by a web the drain adapted to be torn along a web on a line substantially parallel to a rod and adjacent rods are in acute angular relation to each other.

3,860,009
COMPUTER CONTROLLED DEFIBRILLATOR

David Bell, 1804 N. 111th St., and William K. Hagan, 12418 Leavenworth St., both of Omaha, Nebr. 68154

Continuation-in-part of Ser. No. 420,291, Nov. 29, 1973, , which is a continuation-in-part of Ser. No. 219,455, Jan. 20, 1972, Pat. No. 3,782,389. This application Mar. 13, 1974, Ser. No. 450,792
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 D **3 Claims**

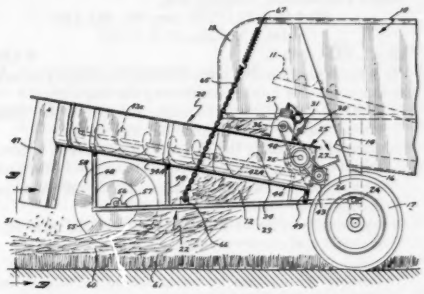


1. A defibrillator comprising in combination,
an electrical power source,
a set of electrodes engageable with a patient,
circuit means connecting said power source to said set of electrodes comprising, a computer means, a storage capacitor means for storing energy derived from said power source, an energy selector means for selecting the energy to be delivered to the patient, said energy selector means also feeding an input to said computer means, a switch means for causing the stored energy to be connected to the patient, said switch means being operatively electrically connected to said computer means, a power monitor means for feeding signals to said computer means when said stored energy is delivered to the patient, said computer means computing the energy delivered to the patient and causing the delivery of energy to the patient to be discontinued when the computed energy substantially equals the selected energy,
said circuit means also comprising means for selecting the magnitude of current delivered to the patient responsive to the body resistance of the patient.

3,860,010
CHAFF SAVER FOR COMBINES

Joseph A. Anderson, and Chester G. Neukom, both of Jamestown, N. Dak., assignors to Haybuster Manufacturing Inc., Jamestown, N. Dak.

Filed Sept. 13, 1973, Ser. No. 396,756
Int. Cl. A01f *12/46*
U.S. Cl. 130—24 **10 Claims**

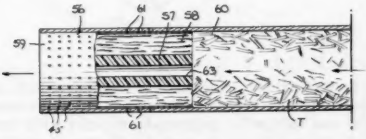


1. In a chaff saver attachment for a grain combine having an opening through which straw is discharged onto the ground, and a grain shoe for separating chaff and tailings from the grain being combined, said grain shoe being positioned to discharge the tailings to the rear of the combine, the improvement comprising conveyor means for collecting and conveying said tailings to a discharge opening positioned at a preselected position to the rear of said combine, and above the straw discharged by said combine.

3,860,011
HOLLOW FILTER

Vello Norman, Durham, N.C., assignor to Liggett & Myers, New York, N.Y.

Filed Aug. 27, 1973, Ser. No. 391,834
Int. Cl. A24d *01/04*; **A24f** *05/04*
U.S. Cl. 131—10.5 **9 Claims**



1. The combination of
a cigarette tobacco section;
a filter immediately adjacent said tobacco section comprising a rigid tube extending the length of of said filter and defining a smoke passage aligned with said cigarette tobacco section for passage of an unfiltered portion of smoke said passage being of constant cross-sectional area throughout and being of a cross-sectional size to have a draw resistance for controlling the amount of unfiltered smoke entering a smoker's mouth for a given draw; a layer of compacted filter material circumferentially about said tube for receiving a second portion of smoke from said tobacco section for substantially complete filtration

therein; and a cylinder of porous plugwrap paper about said layer of compacted filter material; and

a cylinder of tipping paper joining said tobacco section and said filter together, said tipping paper having a plurality of perforations communicating the surrounding air with said layer of compacted filter material via said porous plugwrap paper, said perforations and said layer of filter material defining an air flow path having a draw resistance to complement said draw resistance of said smoke passage whereby for a given draw a desired amount of ventilation air and unfiltered smoke enters the smoker's mouth.

3,860,012

METHOD OF PRODUCING A RECONSTITUTED TOBACCO PRODUCT

William A. Selke, Stockbridge, Mass., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 21, 1973, Ser. No. 362,148
Int. Cl. A24b *3/14, 15/08*
U.S. Cl. 131—140 C **9 Claims**

1. A method of making a reconstituted tobacco product for use in a smokable article, comprising the steps of:

a. cooking natural tobacco stalk material at an elevated temperature to individualize the stalk fibers,

b. thereafter soaking the cooked stalk fibers in a concentrated caustic solution to produce modified fibers which do not bond to each other or to other fibrous material as readily as do fibers not so modified.

c. separating other natural tobacco material into fibrous material and extract material,

d. mixing the modified fibers with the fibrous material and forming the mixture by papermaking techniques into a paper-like web, and

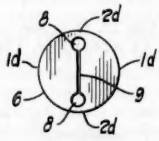
e. impregnating the web with the extract material.

3,860,013

DENTAL STRIP

Henry P. Czapor, 11501 W. Pleasant Valley Rd., Cleveland, Ohio 44130

Continuation-in-part of Ser. No. 159,661, July 6, 1971, abandoned. This application July 17, 1972, Ser. No. 272,465
Int. Cl. A61c *15/00*
U.S. Cl. 132—91 **4 Claims**



1. A dental strip comprising a cleaning section of flexible and stretchable elastic material, and handle means integral with said section for gripping by the user while introducing said section between the teeth for cleaning thereof, said handle means being a semi-circular sheet like body of the elastic material, each end of the arcuate margin of the semi-circular portion being joined to the adjacent arcuate margin to form a cleaning section in that area.

3,860,014

HAIR CLIP

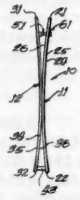
Mary A. Clifton, 348 Brown Dr., Sierra Vista, Ariz. 85635

Filed Aug. 30, 1973, Ser. No. 393,222
Int. Cl. A45d *8/00*
U.S. Cl. 132—46 R **5 Claims**

1. A hair clip intended for placement on an individual's head to hold portions of an individual's hair in a desired position, comprising:

a pair of elongated resilient clip members each of matching curvilinear form as being approximate mirror images of each other, each clip member having a forward end, a rearward end, a convex curved shaped top side edge, a concave curved shaped bottom side edge, an interior surface, and an exterior surface, the concave curved bottom side edges adapted with the clip members extending substantially normal to the scalp in a manner to direct outwardly from the scalp that portion of an individual's hair clamped between the clip members, each of the clip members being bowed and curved along their longitudinal axis between their respective forward and rearward ends to define their respective interior surface as a longitudinally extending convex bowed arcuate surface between the respective ends of the clip member;

the interior surfaces of the clip members disposed in overlapping juxtapositioned confronting relationship with their respective forward ends and rearward ends disposed substantially adjacent and slightly spaced from each other and with the central bowed area of the clip members contacting each other;

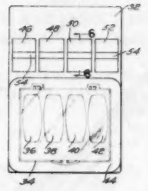


a hinge element formed of polypropylene plastic material and having a rectangular closed frame type configuration with end portions thereof molded integrally in the respective rearward ends of each of the clip members and projecting outwardly from the associated interior surfaces substantially normally therebetween to provide a hinge permitting the pivotal movement of the clip members in a plane normal to the plane of the hinge element between an open position wherein the interior surfaces are spaced apart from each other, and a closed position wherein the interior surfaces are in contact with each other along their midsections thereof;

a projection provided on the forward end of one of the clip members extending perpendicular to the interior surface thereof and being of a length to engage the forward end portion of the other clip member; and

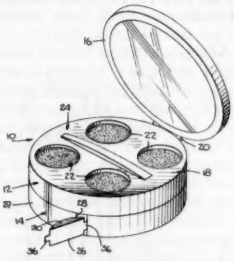
an aperture in the forward end of the other clip member extending completely therethrough to coact with the projection as to receiving and detachably retaining a portion of the projection therein when the clip members are in the closed position.

3,860,015
COSMETIC SELECTING CONTAINER
Richard E. Tarro, 425 Broadway, Providence, R.I. 02914
Filed Jan. 2, 1974, Ser. No. 430,208
Int. Cl. A45d *40/00*
U.S. Cl. 132—79 G 10 Claims



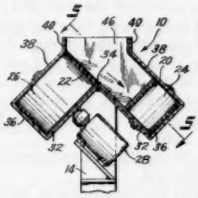
1. A cosmetic selecting device comprising a container for the cosmetics, a mirror surface portion associated with said container, and a strip of colored material positioned on said mirror, said material having the color of the cosmetic in said container.

3,860,016
DEVICE FOR APPLYING FACIAL COSMETICS
Stuart W. Mackiernan, 690 Osceola Ave., Winter Park, Fla. 32789
Filed June 21, 1973, Ser. No. 372,199
Int. Cl. A45d *33/00*
U.S. Cl. 132—83 B 11 Claims



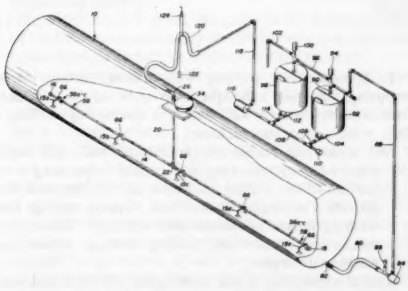
1. A device useful in the application of cosmetic material comprising,
- an elongated strip having secured thereon a plurality of pad-like elements adapted to be coated with a cosmetic material when brought in contact therewith and thereafter to release said cosmetic material when placed in contact with a surface to which the cosmetic material is to be applied, said elements being placed successively along said strip,
- container means for housing said strip, said container means having an opening therein adapted to successively pass said elements on said strip out of said container means, and
- cutting means operatively connected to said container means proximate said opening and effective to separate at least one of said elements from said strip when said strip is urged into contact with said cutting means.

3,860,017
COIN CIRCULATING FEED CONVEYOR
Thomas J. Black, Vienna, and Frank L. Bennett, Chantilly, both of Va., assignors to Universal Machine Company, Inc., Dallas, Tex.
Filed Oct. 2, 1973, Ser. No. 402,835
Int. Cl. G07d *9/00*
U.S. Cl. 133—1 R 9 Claims



1. A conveyor system for supplying coins to a plurality of coin processing machines comprising:
- means defining two generally parallel paths for coins and including upstanding wall means between said paths, said wall means having openings therein, spaced along said paths, for receiving coins from said paths and directing the same to said plurality of coin processing machines;
- conveyor means for conveying coins along said parallel paths in respectively opposite directions and being sloped laterally toward said wall means so that coins thereon gravitate laterally of said paths toward said wall means and openings;
- said conveyor means sloping upwardly in the direction of coin movement with a downstream end of each path being higher than an upstream end of the other and higher than said wall means; and
- the said laterally sloped conveyors causing coins from the downstream end of each path to gravitate therefrom to the upstream end of the other path.

3,860,018
METHOD OF AERATING AND CLEANING A MILK TANK
Jerome A. Reiter, Lancaster, Tex., assignor to Reiter Industries, Inc., Dallas, Tex.
Division of Ser. No. 134,698, April 16, 1971, Pat. No. 3,810,604. This application Dec. 14, 1972, Ser. No. 315,202
Int. Cl. B08b *9/00*, *9/10*
U.S. Cl. 134—22 R 3 Claims



1. The method of aerating and cleaning a milk tank comprising:
- clamping horizontal pipe along and above the bottom of the milk tank, extending a vertical pipe through an opening in the top of the milk tank into communication with said horizontal pipe,

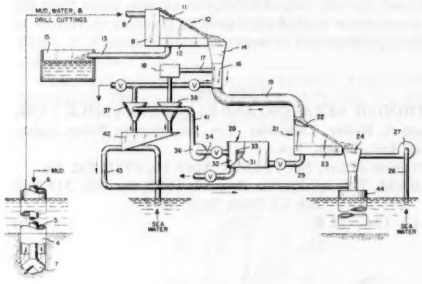
directing pressurized gas down the vertical pipe when the milk tank contains a quantity of milk,
directing said gas from the bottom of the vertical pipe through the horizontal pipes extending along the length of the milk tank and spaced above the bottom of the milk tank,
releasing the gas from spaced apart openings in the horizontal pipes such that the gas bubbles up through the milk in order to aerate the milk,
dispensing the milk from the milk tank,
after the milk is dispensed from the milk tank, directing a pressurized cleaning liquid through the vertical pipe and through the horizontal pipes and out the openings such that sprays of the cleaning liquid are directed against the interior of the milk tank to effect cleaning thereof,
attaching a return hose to an outlet in the bottom portion of the milk tank,
pumping the cleaning liquid and remaining milk from the bottom of the tank,
unclamping said horizontal pipe to enable cleaning of the tank, and
reclamping said horizontal pipe to enable further aeration and cleaning.

3,860,019

APPARATUS FOR AVOIDING WATER POLLUTION AT AN OFFSHORE DRILLING SITE

Loy P. Teague, Morgan City, La., assignor to Texaco Inc., New York, N.Y.

Filed July 27, 1972, Ser. No. 275,677The portion of the term of this patent subsequent to Sept. 26, 1989, has been disclaimed.
Int. Cl. B08b *3/10, 15/00*
U.S. Cl. 134—109 **8 Claims**



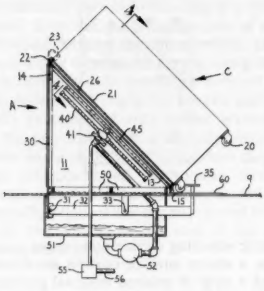
1. Apparatus for purging well drilling cuttings of water polluting materials subsequent to removal of said cuttings from a subterranean well within a circulating drilling mud flow, which apparatus includes;
first separating means communicated with said subterranean well for receiving and initially separating a major portion of the drilling mud from said drilling mud flow to provide a substantially mud free, drilling cuttings stream, washing means communicated with said first separating means to contact said drilling cuttings stream with a washing detergent,
second separating means communicated with said washing means to receive a mixture of detergent and drilling cuttings, and to segregate the latter therefrom free of said water polluting materials, and
return conduit means communicated with said second separating means to receive detergent from the latter and for recirculating the same for introduction to said washing means.

3,860,020

TRAY CART WASHER

Milton H. King, Jr., 382 Wailupe Cir., Honolulu, Hawaii 96821

Filed July 9, 1973, Ser. No. 377,457
Int. Cl. B08b *3/02, 9/08*
U.S. Cl. 134—111 **8 Claims**



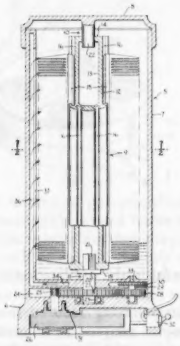
1. A tray cart washer comprising a wash chamber having a pair of side walls defining an inclined open top sloping down substantially to floor level on the front side of said chamber, wash and rinse nozzles in said chamber directed toward said open top, means to support a tilted tray cart in inclined position on said open top of said chamber with the inside of said cart exposed to sprays from said nozzles, and means to clamp the top of the cart against said chamber.

3,860,021

WASHING DEVICE FOR COMBS AND THE LIKE

Ivan M. Saric, 919 N. Glenview, Wauwatosa, Wis. 53213

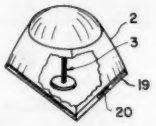
Filed July 19, 1973, Ser. No. 380,719
U.S. Cl. 134—140 **8 Claims**



1. A comb washing device comprising:
A. a jar to contain a supply of cleaning liquid, said jar having an access opening in its top;
B. a rotatable comb carrier;
C. comb gripping means on the comb carrier, adapted to engage the back of combs and hold the same with their teeth projecting radially outward,
said comb carrier with the plurality of combs thereon being readily insertable into and removable from the jar through its access opening;

D. a cover to close the access opening of the jar;
E. bearing means to rotatably support the comb carrier in the jar; and
F. power driven drive means connectable with said comb carrier upon insertion thereof into the jar to impart rotation to the comb carrier.

3,860,022
MOSQUITO AND INSECT UMBRELLA
Lila Arndt, and Norman J. Arndt, both of 2436 N. Sawyer Ave., Chicago, Ill.
Filed Mar. 19, 1973, Ser. No. 342,705
Int. Cl. A45f 1/04
U.S. Cl. 135—2 **1 Claim**



1. A portable collapsible screen shelter including a frame assembly and a cover comprising, in combination:
a hollow axially elongated first cylindrical member having a top end, a bottom end, and cylindrical side walls with an axial bore extending therethrough;
a second elongated cylindrical rod member having an exterior diameter less than the diameter of said first cylindrical member bore and having a top end and a bottom end, the top end of said second rod telescopically received in said bore through said bottom end of said first cylindrical member and adapted for axial reciprocal movement relative thereto;
a pair of axially aligned diametrically opposed apertures provided in the first cylindrical member adjacent the bottom end thereof;
a pair of similarly sized diametrically extending axially aligned bores provided in said second rod member adjacent the top end thereof, said first and second mentioned pairs of apertures adapted to be axially aligned with each other when that second rod is in its telescopically extended position relative to said first cylindrical member; an elongated pin member adapted to be passed freely through said aligned apertures for detachably maintaining said rod and said cylindrical member in their respective telescopically extended positions, said pin being removable to permit telescopic collapsing of said second rod into said second first cylindrical member;
a hollow open-ended cylindrical shaped angular collar member permanently affixed to the top end portion of said first cylindrical member and projecting radially outwardly therefrom defining a plane normal to the axis of said first cylindrical member;
a plurality of flange members formed integrally with said angular collar member and spaced circumferentially at equal intervals thereabout;
a plurality of elongated rib members each having an inner end and an outer end;
pivot means associated with each inner end of each rib member and pivotally connecting that associated rib member to an associated flange of said angular collar for swinging movement thereabout between a collapsed position lying parallel to the axis of the first cylindrical member and an extended operable position radiating outwardly from said angular collar at an angle to the first cylindrical member;
a hollow open-ended tubular sleeve member disposed concentrically with said first cylindrical member at a position beneath the collar member and above the bottom end of the first cylindrical member, the sleeve member mounted for free sliding reciprocal movement along the first cylindrical member between an operable position effecting the outward radiating position of said ribs and an inoperable position effecting the collapsing of said ribs to their storage position;
a multiplicity of flange members formed integrally with the sleeve member above the top end portion thereof and spaced at equal distances circumferally thereabout, said sleeve flange members being equal in number and circumferal spacing to said angular collar member flange members;
a plurality of rigid supporting ribs equal in number to the number of said rib members with each supporting rib being of a flat elongated rectangular configuration having an inner end and an outer end;
pivot means associated with each supporting rib and pivotally connecting its inner end to an associated flange of said sleeve member;
pivot means associated with each outer end of each of said supporting ribs and pivotally connecting each outer end at a stationary position disposed intermediate the inner and outer ends of said associated rib member such that movement of said sleeve member axially along said first cylindrical member effects movement of the supporting ribs in a manner to collapse the associated ribs to the storage position or to open the ribs to the radiating operable position;
resilient boss means affixed to a portion of the exterior cylindrical side wall of said first cylindrical member and disposed in a position thereon adapted to engage a portion of said sleeve member when said sleeve member is in the operable position;
an axially elongated slot defined in a cylindrical side wall of said sleeve member and extending completely therethrough and adapted to engage said resilient boss member when said sleeve member is in the operable position wherein said resilient boss is engaged in said slot to retain the sleeve member so positioned, said resilient boss member depressable radially inwardly of said first cylindrical member to free the same of said slot to release said sleeve member therefrom and permit movement of the sleeve member to said inoperative storage position;
the bottom end of said rod member being provided with helical screw threads over a segment of the exterior circumference thereof;
a substantially flat circular disc having a top surface and a bottom surface;
a cylindrical recess formed integrally in the center of the top surface of said disc concentrically therewith and provided with screw threads about the interior surface thereof adapted to threadably receive therein said threaded bottom end of said rod to support said rod on any suitable supporting surface;
a cylindrical recess formed integrally in the bottom surface of said disc concentrically therewith and provided with screw threads about the interior surface thereof;
an elongated cylindrical pole member provided with screw threads about the exterior of both ends thereof;
a second substantially flat circular disc having a top surface and a bottom surface;
a cylindrical recess formed integrally in the top surface of said second disc concentrically therewith and provided with screw threads about the interior surface thereof;
said elongated pole member adapted to have one end threadily engaged in the recess of the bottom surface of said first mentioned disc with its opposite end threadily engaged in the recess of said second disc for supporting said first mentioned disc a spaced distance above said second disc;
said shelter cover comprising a roof portion and four sidewall portions joined along their top edges with the roof portion and extending downwardly and outwardly therefrom;
said roof portion being of a generally pyramidal shape and manufactured of tent material and of a size and configu-

ration adapted to be supported by said rib members when in the radiating operative position;

each of said sidewalls being manufactured of nylon netting fabric material with each being in the form of a truncated pyramidal shape and each having its top edges permanently affixed to the adjacent side edges of said roof portion with each of the sides extending downwardly and outwardly therefrom to define base end portions adapted to be placed in resting engagement with the ground;

a zipper extending vertically through one of said sidewall surfaces from the base end portion thereof to the top edge thereof for providing ingress and egress of the shelter when in the operative position;

a horizontally elongated open-ended pocket formed integrally completely along the bottom base end edge of each sidewall surface, each pocket defined and formed by the sidewall surface being folded back onto itself in an overlapping manner and with the overlapped edge being permanently secured to the side surface to form the elongated pocket therealong;

a plurality of elongated cylindrical telescoping poles each including a pair of telescoping segments with each pole having a front end and a back end, each pole associated with one of the sidewall pockets and being axially inserted through the associated pocket providing support and rigidification of the sidewall base bottom edge;

a hook member provided at the front end of each of the telescoping poles;

an eyelet type aperture provided at the back end of each of the telescoping poles;

the telescopic poles being joined together at their juncture points to provide a rigid rectangularly shaped base frame for the shelter which is apart from and separate from the supporting frame assembly, the joining at the juncture point being by the engagement of a hook member of one pole engaging the eyelet member of the adjacent pole at the meeting corner of adjacent side surfaces;

whereby a flexible joint is provided between adjacent poles with an overall rigidifying of the base end bottom edge portions of said cover.

3,860,023

PROCESS FOR IMPROVING THE HANDLING CHARACTERISTICS AND TRANSPORT OF PHOSPHORIC ACID

Robert A. Pendergrast, Atlanta, Ga., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed July 30, 1973, Ser. No. 383,842

Int. Cl. F17d *1/16*

U.S. Cl. 137—13 **7 Claims**

1. Method of improving the handling and pumping characteristics of wet-process phosphoric acid and inhibiting the formation of coherent masses of sludge therein during storage and transport comprising adding to said wet process phosphoric acid an effective amount of a cellulosic material.

3,860,024

FROST HEAVE-PROTECTED SLEEVE-CONNECTED SHUT-OFF VALVE

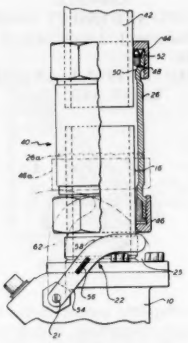
James F. Turley, 446 Lexington Ave., Cranford, N.J.

Continuation-in-part of Ser. No. 270,225, July 10, 1972,. This application Aug. 15, 1973, Ser. No. 388,540

Int. Cl. F16k *17/36*

U.S. Cl. 137—39 **5 Claims**

1. In a frost heave-protected shut-off valve of the type including a body portion having a fluid inlet means and fluid outlet means; a flap valve between said inlet and outlet means including a flap member and a valve seat; said flap member being mounted for rotation with a pivot pin having an external portion extending out of said body portion; a restraining arm including a fusible link being secured to the external portion of said pivot pin, said arm extending transversely from said pin and being rotatable therewith; means normally biasing said flap member toward a closed position; a nipple portion attached to said fluid outlet means and having a weakened shear zone extending about it proximate said body portion; and a sleeve secured in sealing relationship with and mounted in an axially displaceable relationship upon the portion of said nipple non-adjacent said body portion; the improvement comprising:



means for normally restraining said arm at a position maintaining said flap member open against the force provided by said biasing means; and

means for disabling said restraining means upon axial displacement of said sleeve a predetermined distance away from said nipple, to permit said flap member to close against said seat to shutoff fluid flow through said valve.

3,860,025

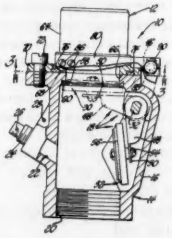
SHUT-OFF VALVE ASSEMBLY WITH FRANGIBLE BODY SECTION

Lowell F. Nelson, Muskegon, Mich., assignor to Enterprise Brass Works, Muskegon, Mich.

Division of Ser. No. 277,692, Aug. 3, 1972, Pat. No. 3,811,456. This application Feb. 4, 1974, Ser. No. 439,023

Int. Cl. F16k *17/36*; F16l *35/00*

U.S. Cl. 137—68 **9 Claims**



1. In an improved shut-off valve assembly of the type including a housing having first and second sections which separate in response to a predetermined force to allow a valve member to move to a closed position, the improvement comprising: said first and second sections being independent of one another; said first section having a body portion including a seating surface for seating engagement with said second section, a plurality of ears disposed about said body portion; fastener means interconnecting said ears and said second section for maintaining said seating surface of said first section in said seating engagement with said second section; and weakened breakaway means between said ears and said body

portion of said first section for allowing said body portion to separate from said ears and said second section in response to a predetermined force, said weakened breakaway means comprising groove means extending into said first section from said seating surface and disposed between each ear and said body portion, and seal means disposed in said groove means for effecting a seal between said sections.

3,860,026

AUTOMATIC AIR VENT

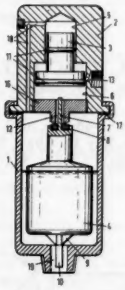
Hermanus Hendrik Van Der Koogh, Hilversum, Netherlands, assignor to Industrieele Maatschaddij Zutphen B. V., Dreef 5, Zutphen, Netherlands

Filed May 29, 1973, Ser. No. 364,323

Claims priority, application Netherlands, Apr. 26, 1973, 7305839

Int. Cl. F16k *45/02, 31/34*

U.S. Cl. 137—202 **11 Claims**



1. An automatic air vent for use in a liquid-filled system comprising a housing having a float chamber, and a float in said chamber under the control of the said liquid; and in which there is further provided an auxiliary chamber, an intermediate passage in sealed relation between said auxiliary chamber and said float chamber, valve means actuated by said float for closing-off said intermediate passage; a discharge orifice connected to the said auxiliary chamber; a piston in said auxiliary chamber, which said piston in a certain operative position thereof closes off said discharge orifice; and in which on the side of said piston remove from said intermediate passage said auxiliary chamber is in permanent communication with said float chamber.

3,860,027

180° LOOP CARRIER FOR A SLURRY LINE

David L. McCain, Ponca City, Okla.; Gordon R. Haworth, Glencoe, Ill., and Ronald W. Umphrey, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Mar. 30, 1973, Ser. No. 346,519

Int. Cl. H02g *11/00;* **B65g** *53/30*

U.S. Cl. 137—344 **11 Claims**

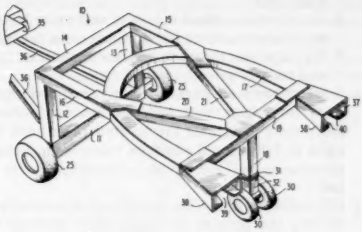
1. A conveyor apparatus for moving a slurry line movably supported by plural carts through a 180° bend comprising:

a. a support frame for secure positioning at a selected 180° bend position;

b. spaced conveyor engaging means;

c. 180° turn conveyor means attached to said support frame above said slurry line; and

d. means carried by said 180° turn conveyor means and spaced to coincide with said spaced conveyor engaging



means for engaging said engaging means and moving said slurry line around said 180° turn conveyor means.

3,860,028

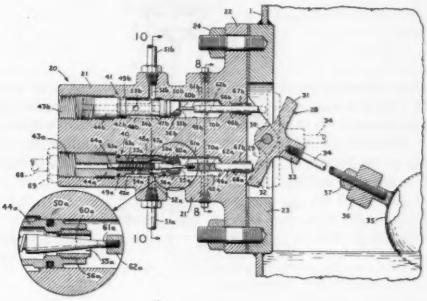
FLUID LEVEL CONTROL SYSTEM AND FLUID LEVEL ACTUATED CONTROLLER THEREFOR

Beal P. Moore, Waldwick, and Raymond J. Dussia, Chatham, both of N.J., assignors to Atlas Valve Company, Newark, N.J.

Filed Jan. 22, 1973, Ser. No. 325,129

Int. Cl. F16k *31/34*

U.S. Cl. 137—411 **13 Claims**



1. A control valve responsive to the level of process fluid in a reservoir for delivering a modulated pressure fluid signal including,

a. a valve body having a connecting means thereon for attaching said valve body to the reservoir,

b. said valve body having an inlet for pressure fluid and an outlet for delivering signal pressure fluid,

c. pilot valve assembly means disposed in said valve body between said inlet and outlet to modulate the flow of signal pressure fluid responsive to change in the level of process fluid in said reservoir,

d. said pilot valve assembly means including,

1. a valve chamber in said valve body in communication with said inlet and outlet,

2. a valve seat means mounted in said valve body and forming a valve port therethrough in communication with said valve chamber to pass pressure fluid from the inlet to the outlet for the valve body,

3. a tapered valve head mounted for slidable movement in the valve body towards and away from the valve seat means normally disposed to maintain said valve port closed,

4. said valve body having a bore in alignment with the valve seat means communicating at one end with said valve chamber and at the end remote therefrom opening onto the exterior of said valve body,

5. a valve stem slidably mounted in said bore connected at one end to the tapered valve head and having sufficient length to extend beyond the exterior of the valve body, and
6. an adjustable bleed means in said valve body in communication with the valve chamber on the inlet side of the valve seat means to regulate the rate of response of said control valve,

e. level responsive means movably connected on said valve body for engagement with the exterior portion of the valve stem to actuate the tapered valve head from fully open to fully closed positions relative the valve port responsive to the level of the process fluid in the reservoir and

f. adjustable means on the valve body operatively disposed to vary the position of engagement between the valve stem and the level responsive means.

3,860,029

VALVE SYSTEM

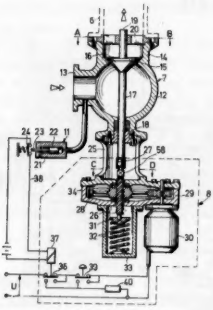
Peter Hubler, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Sept. 17, 1973, Ser. No. 397,932

Claims priority, application Switzerland, Sept. 22, 1972, 13927/72

Int. Cl. F16k *17/00;* **H02p** *3/00, 15/00*

U.S. Cl. 137—487.5 **8 Claims**



1. A valve system comprising a fluid flow control valve having a valve closure member for controlling a flow of fluid through said valve and means for biasing said closure member towards a predetermined end position under a biasing force; an electric motor for exerting a force to resist said biasing force; a transmission between said motor and said closure member, said transmission including a non-self-locking nut and screw drive; means for sensing a predetermined condition in the fluid upstream of said valve; and means for de-energizing said motor in response to said condition exceeding a preset value to allow said closure member to move to said end position under said biasing force.

3,860,030

PLURAL-HEADER BLENDING SYSTEM

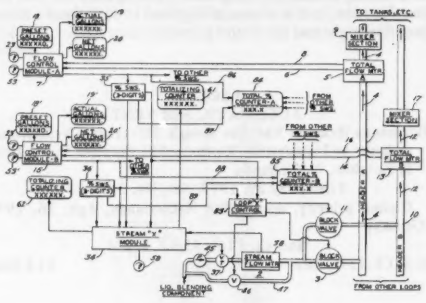
Robert Mayer, Ardmore, Pa., assignor to Sun Oil Company, Philadelphia, Pa.

Filed Dec. 7, 1973, Ser. No. 422,801

Int. Cl. G05d *11/13*

U.S. Cl. 137—563 **10 Claims**

1. Stream-type liquid blending apparatus comprising a pair of independent blending headers, a plurality of flow loops, means for circulating a respective liquid blending component through each of said loops, separate controllable means coupled to each of said loops for causing the corresponding blending component to be fed into either of said headers, and manually-operable means for selectively operating the controllable means of each loop, thereby to cause the corresponding



blending component to be fed into a selected one of the two headers.

3,860,031

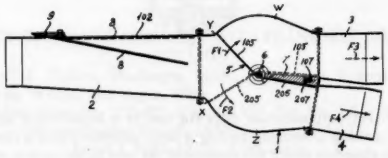
PNEUMATIC TOBACCO FEED SYSTEM

Walter Grilli, Bologna, Italy, assignor to AMF Incorporated, White Plains, N.Y.

Continuation of Ser. No. 668,485, Sept. 18, 1967, abandoned. This application July 18, 1969, Ser. No. 871,743

Int. Cl. B65g *53/56*

U.S. Cl. 137—610 **3 Claims**



1. A two-way penumatic valve for use in a pneumatic feed system comprising

a box having opposite walls each with a segment arcuately shaped for a substantial angular distance,

an inlet at one end of said box and two outlets at the opposite end of said box from said inlet,

a switch valve pivotally mounted inside said box for movement between a first position opening one of outlets to said inlet and closing the second of said outlets, and a second position opening the second of said outlets to said inlet and closing the one of said outlets,

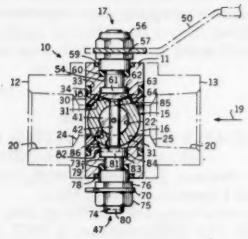
said switch valve comprising two integral flaps each cooperating to seal with a segment of a different one of said opposite walls adjacent thereto such that movement of said switch valve from one position to another causing the one of said flaps closing one of said outlets to move along the arcuate segment of the adjacent wall as the other of said flaps moves towards the other wall and to leave said segment substantially at the same moment the other of said flaps engages the arcuate segment of the wall adjacent thereto, and

abutment means inside said box limiting the pivotal movement of said switch valves between said first and second positions.

3,860,032
BALL VALVE WITH FLOW CONTROL

Gerald L. Rogers, Webster Groves, Mo., assignor to Chemetron Corporation, Chicago, Ill.

Filed Oct. 27, 1972, Ser. No. 301,664
Int. Cl. F16k *43/00*
U.S. Cl. 137—614.17 **1 Claim**



1. A ball valve comprising:

a. a body including a valve chamber and inlet and outlet ports communicating with said chamber,

b. a ball means disposed within the valve chamber and rotatable between an open and a closed position said ball means including a conduit communicating between the inlet and outlet ports in the open position,

c. sealing means between the ball means and the body,

d. first actuating means rotating the ball means between the open and closed position and including;

1. a first key mounted within the body transversely of the conduit and having a connection with the ball means for rotating said ball means between the open and closed positions,

e. a flow control means including shaft means journalled in and carried by the ball means for rotatively mounting said flow control means within said conduit, and

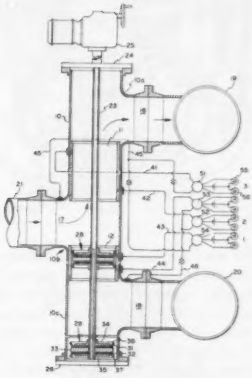
f. second actuating means rotatively mounted in an aperture of the wall of the body transversely of the conduit and having a connection with the shaft means for selectively rotating said flow control means within the conduit to restrict flow through the conduit when the ball means is in the open position, the said connections having clearance for enabling movement of the ball means relative to the body and against the sealing means when the ball means is in the closed position with the flow control means rotated to and maintained in any selected position within the conduit.

3,860,033
FLOW DIVERTING APPARATUS AND METHOD

Marvin H. Grove, and Ronald G. Dunegan, both of Houston, Tex., assignors to M & J Valve Company, Houston, Tex.

Filed Apr. 13, 1973, Ser. No. 350,820
Int. Cl. F16k *11/02, 1/44*
U.S. Cl. 137—625.5 **7 Claims**

1. In a flow diverter, a generally cylindrical shaped body formed from a plurality of sections, means for closing the ends of the body, certain sections of the body having side flow openings to provide at least first, second and third flow openings spaced along the length of the body, a first cylindrical sleeve carried by the body and positioned between the first and second flow openings, a second cylindrical sleeve carried by the body and spaced axially from the first sleeve and positioned between the second and third flow openings, each sleeve having an internal cylindrical surface of like internal diameter that is less than the internal diameter of adjacent sections of the body and of substantial axial length, first and second sealing assemblies adapted to have sealing engagement with the inner peripheral surfaces of the sleeves, operating rod means extending axially of the body, the sealing assemblies being carried by said operating rod means, means external of the body for actuating the rod means to position the sealing assemblies in predetermined operating positions, each sealing assembly comprising two axially spaced and oppositely faced sealing cups of resilient material constructed to have sealing engagement with the inner cylindrical surface of a sleeve on axially spaced annular sealing areas, the sealing cups of each sealing assembly being dimensioned to have an external diameter greater than the inner diameter of a cooperating sleeve



when in a position displaced from the sleeve whereby each resilient member is contracted radially when moved axially to a position within a sleeve, the space between the sealing cups of each sealing assembly being closed when the assembly is within a sleeve, the positioning of the sealing assemblies on the rod means and the positioning of said assemblies within or out of the sleeves serving to divert flow through the body by way of either a flow path between the first and second flow openings or a flow path between the second and third flow openings.

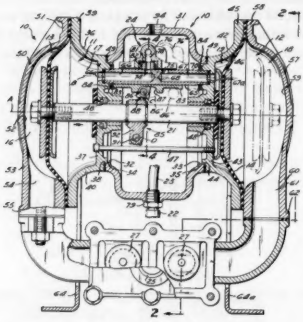
3,860,034
SLIDE VALVE

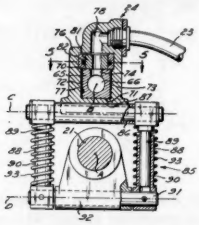
Warren E. Rupp, Mansfield, Ohio, assignor to The Warren Rupp Company, Mansfield, Ohio

Division of Ser. No. 199,250, Nov. 16, 1971, Pat. No. 3,782,863. This application June 28, 1973, Ser. No. 374,478
Int. Cl. F16k *11/06*
U.S. Cl. 137—625.25 **12 Claims**

1. A fluid control valve comprising a first member fixed with respect to a support and having an outer slide surface and an internal fluid passage communicating with a port in said slide surface and also with an opening in said first member spaced longitudinally a substantial distance from said port in said first member, a second member slidably mounted on said slide surface of said first member and having a port adapted to be put into communication with said port in said first member in fluid-tight sealing engagement, and a flexible conduit secured at one end to said second member and communicating with said port in said second member and having a portion spaced from said one end and carried by said support, said flexible conduit being adapted to communicate at its other end with a source of fluid under superatmospheric pressure, whereby said second member may be slidably positioned on said slide surface of said first member in a first position in which said port of said first member and only said port of said second member are in communication and provide a fluid path extending through said flexible conduit and said ports and through said passage and said opening in said first member,

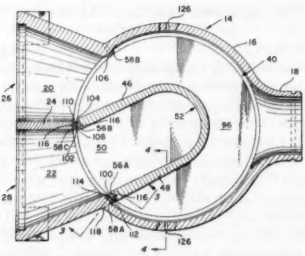
and also in a second position in which said ports do not communicate and which provides a fluid path extending through





said opening, and through said passage and said port of said first member and outside of said flexible conduit.

3,860,035
MODIFIED SLURRY PUMP
Charles A. Semple, Midland, Tex., assignor to Engineered Concrete Placer, Inc., Midland, Tex.
Filed Mar. 2, 1973, Ser. No. 337,485
Int. Cl. F16k *11/02*
U.S. Cl. 137—625.47 **8 Claims**



1. A slurry pump valve for pumping concrete slurry comprising:

A. a cylindrical valve housing having an annular top with an inlet opening therethrough, and first and second outlet chambers from a side thereof separated by an intermediate partition wall;

B. a hollow rotatable valve member in said housing including:

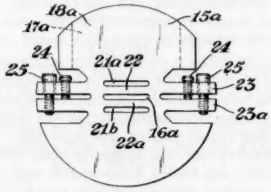
i. cylindrical upper and lower flanges; and

ii. vertical extending members between said flanges having a closing semi-cylindrical inner throat for coacting with said inlet opening, and defining an aperture chamber for selectively communicating said inlet opening with said first and said second outlet chambers upon rotation of said valve member;

C. replaceable upper and lower cylindrical wear rings mounted interiorly in said valve housing; and

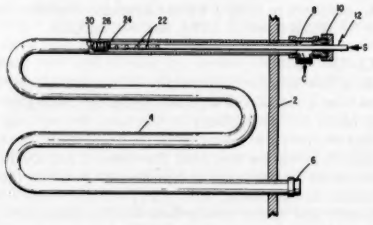
D. replaceable cylindrical wear rings mounted on said upper and lower flanges of said valve member and coactable with said upper and lower wear rings in said valve housing.

3,860,036
VARIABLE GEOMETRY FEED BLOCK FOR MULTILAYER EXTRUSION
Ritchey O. Newman, Jr., Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Continuation-in-part of Ser. No. 85,860, Nov. 2, 1970, abandoned. This application Nov. 6, 1972, Ser. No. 304,262
Int. Cl. F15d *1/00*
U.S. Cl. 138—45 **8 Claims**



1. A device comprising a body having generally opposite first and second sides, said body defining: at least one passage with an inlet port in the first side, an outlet port in the second side and at least one flexible wall portion; at least one cavity spaced apart from said passage by said flexible wall portion; and at least one adjusting means in operational combination with and spaced apart from said flexible wall portion and said cavity, said adjusting means adapted to flex said wall portion by application of a leverage producing force to vary the cross-sectional configuration of said passage.

3,860,037
TUBE PLUGGING DEVICE
Edward A. Rowe, Mentor, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio
Filed June 26, 1973, Ser. No. 373,755
Int. Cl. F16l *55/10*
U.S. Cl. 138—89 **1 Claim**

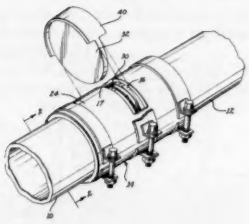


1. A device for reducing the heat transfer capacity of an open tube, which comprises

a. a plug having a plurality of washers with interposed smaller annular spacers, for forming a fluid-tight seal with the inner surface of the open tube, and

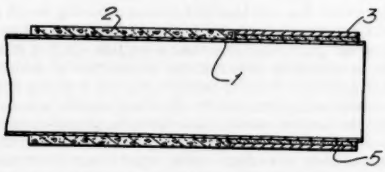
b. a connector tube attached to the plug, the connector tube having a smaller diameter than the plug to provide an annular space between the open tube inner surface and the connector tube, and at least one opening adjacent to the plug to permit circulation of a fluid through the connector tube, the opening and the annular space.

3,860,038
TEST COUPLING
Joseph M Forni, Scottsdale, Ariz., assignor to Gerald V. Burton, Phoenix, Ariz., a part interest
Filed Jan. 8, 1973, Ser. No. 322,027
Int. Cl. F16l *55/10*
U.S. Cl. 138—94.3 **6 Claims**



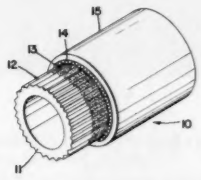
1. A test coupling for joining the ends of two cylindrical fluid conduits to facilitate testing of the fluid system of which the conduits are a part, comprising: a resilient cylindrical sleeve member for sealingly engaging said ends of said conduits to provide a continuous fluid channel through said conduits and sleeve member; means defining an arcuate slot extending through a portion of said resilient cylindrical sleeve member; said slot positioned in a plane transverse of said conduits and intermediate the ends of said resilient cylindrical sleeve member; a disc member removably mounted in said resilient cylindrical sleeve member and extending into said slot, said disc blocking the flow of liquid through said resilient cylindrical sleeve member; said disc including an arcuate flange on the periphery of said disc, said arcuate flange abutting the exterior of said resilient cylindrical sleeve member and maintained in sealing engagement therewith when said disc member extends into said slot; and clamp means for clamping said disc in place in said resilient cylindrical sleeve.

3,860,039
PIPELINES
John William Ells, Bexleyheath, England, assignor to The British Petroleum Company Limited, London, England
Filed May 11, 1973, Ser. No. 359,434
Claims priority, application Great Britain, May 26, 1972, 24932/72
Int. Cl. F16l *9/22*
U.S. Cl. 138—103 **8 Claims**



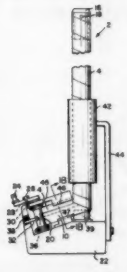
1. A length of steel pipe suitable for welding to other similar lengths of steel pipe to form an underwater pipe-line having an outer diameter of from about 14 to about 72 inches and a wall thickness of from about ¼ to about 1½ inches, and having a steel sleeve whose wall thickness is from about ¾ to about 2 times the wall thickness of the pipe, whose length in relation to the outer diameter of the pipe is from about ½:1 to about 5:1, and whose inner diameter is a maximum of about 6 inches greater than the outer diameter of the pipe.

3,860,040
HOSE CONSTRUCTION
Dennis W. Sullivan, Willoughby Hills, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio
Filed Mar. 7, 1973, Ser. No. 338,860
Int. Cl. F16l *11/08*
U.S. Cl. 138—124 **5 Claims**



1. A hose construction comprising a core tube of flexible material and having generally axially extending striations about its outer periphery, said striations containing discrete adhesive in contact with the surface thereof, and a layer of flexible material surrounding the core tube, said layer including first portions extending into said striations and other portions exterior of said striations, said layer being bonded to said core tube by said adhesive, said striations comprise raised ridges with recesses therebetween, said layer comprises a tensioned reinforcement of flexible yarn that slightly flattens said ridges of said striations whereby said first portions substantially fill said recesses and substantially uniformly distribute the adhesive therein, and the striations are initially of a depth less than the thickness of said layer.

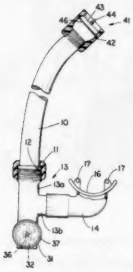
3,860,041
SELF-ERECTING TUBE
Leigh David Leiter, Willow Grove, Pa., assignor to Ametek, Inc., New York, N.Y.
Filed May 29, 1973, Ser. No. 364,527
Int. Cl. F16l *9/16*
U.S. Cl. 138—144 **8 Claims**



1. A self-erecting tube comprising:
a plurality of axially extending helical ribbons of spring material having a common axis and the same helix angle, said ribbons being axially spaced with the turns of adjacent ribbons overlapping with the upper portion of the outer face of each ribbon turn inside of the outermost ribbon being bonded to the lower portion of the inner face of the turn of the ribbon adjacent said outer face, and

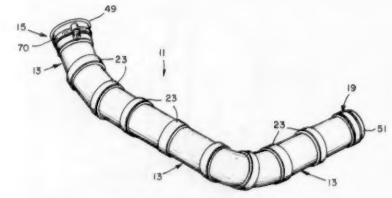
the outermost ribbon forming the outer surface of the tube of substantially uniform diameter.

3,860,042
DUAL VALVE SNORKEL
Thomas N. Green, 4431 Linwood Ct., Apt. 2, Indianapolis, Ind. 46201
Filed June 4, 1973, Ser. No. 366,551
Int. Cl. A63b *7/00*
U.S. Cl. 128—145 A **1 Claim**



1. A snorkel-type swimming aid comprising an elongated tube, a hollow T-shaped fitting removably secured to and communicating with one end of said tube, a mouthpiece member secured to and extending sidewardly from that leg of said T-fitting to which said tube is secured and communicating with the interior thereof, inhalation valve means removably secured to the other end of said tube permitting air to be drawn into the tube but not expelled therefrom, exhalation valve means disposed at the opposed ends of the other two legs of said T-fitting, said exhalation valve means permitting air to be expelled from said fitting but preventing water flow into said fitting when air is drawn into said tube through said inhalation valve means.

3,860,043
DUCT
Thomas A. Kutnyak, Anaheim, and Robert Trelease, Los Angeles, both of Calif., assignors to Automation Industries, Inc., Los Angeles, Calif.
Filed Dec. 7, 1972, Ser. No. 312,855
Int. Cl. F16l *9/14*
U.S. Cl. 138—153 **5 Claims**



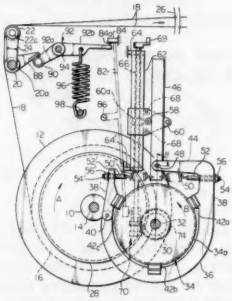
1. Light-weight, semi-rigid waste drain duct for use in toilet drain systems and the like, as in aircraft, the duct including the combination of:

first and second reinforcing fiberglass plies impregnated with polyester resin in concentric relation to each other forming a unitary portion of said duct;

a non-porous self-extinguishing thermoplastic film disposed between said first and second reinforcing plies preventing liquids from penetrating through the wall of said duct;

a smooth, seamless and water-repellent plastic gel-coat permanently bonded to the inner wall of the innermost of said reinforcing plies, and a plurality of spaced reinforcing bands integral with the duct, said bands being formed of fiberglass.

3,860,044
WARP TENSION CONTROL MECHANISM
Yukio Mizuno, Tokyo, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan
Filed Feb. 14, 1973, Ser. No. 332,331
Claims priority, application Japan, Feb. 15, 1972, 47-15918; July 10, 1972, 47-68820
Int. Cl. D03d *49/06, 49/08*
U.S. Cl. 139—109 **8 Claims**



1. A warp tension control mechanism for a loom having warp yarn supply means driven for rotation by a tension in a warp yarn fed from a yarn supply package of a roll form on said warp yarn supply means comprising, in combination, a brake wheel having a circumferential working susrface and rotatable with said warp yarn supply means, the brake wheel being driven to rotate about its axis by said yarn supply means, a brake frame which is positioned around part of said working surface of said brake wheel, a first brake arm which is fast on one end portion of said brake frame, a second brake arm which is pivotally connected to the other end portion of said brake frame and which extends substantially in parallel to and at a spacing from said first brake arm, said spacing between the first and second brake arms being variable by means of the pivotal connection between said brake frame and said second brake arm, at least three brake shoes one of which is carried on said second brake arm and the others of which are carried on said brake frame, the brake shoes on the brake frame being equidistantly spaced apart from the brake shoe on the second brake arm, said first brake arm having an extension having a leading end portion which is located substantially halfway of said spacing between the first and second brake arms, a guide lever which is connected through a pivot to said leading end portion of said extension and which extends away from said brake wheel, first and second mechanical biasing means associated respectively with said first and second brake arms and urging said guide lever to a neutral position which is substantially in alignment with the axis of rotation of said brake wheel, a movable fulcrum member which is in sliding engagement with said guide lever for allowing the guide lever to turn about the fulcrum member and about the pivotal connection between the guide lever and said leading end portion of said extension, said brake frame being urged to turn about the axis of rotation of said brake wheel to a rest position with said first mechanical biasing means caused to have its biasing force increased and said second mechanical biasing means caused to have its biasing force reduced as a rotation force is imparted from said brake wheel to the brake frame through said brake shoes for moving said guide lever to a position which is

angularly spaced apart from said extension at a reduced angle and for permitting the brake wheel to rotate about its axis by a rotational force imparted thereto from said yarn supply means, and brake torque varying means responsive to variation in the tension of the warp yarn being unwound and fed from said yarn supply means and associated with said fulcrum member for decreasing said angle between said guide lever and said extension in response to an increase in the tension in the yarn so that the biasing force of said second mechanical biasing means is reduced and said brake shoes are urged against said brake wheel with a reduced biasing force.

3,860,045

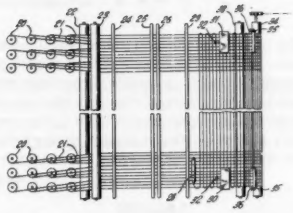
PREFORMED CROSS-LAID FABRIC AND METHOD OF MANUFACTURING THE SAME

Ben C. Worcester, Jr., East Brunswick, N.J., and Doma A. Watson, Bedford, N.H., assignors to Johnson & Johnson, New Brunswick, N.J.

Division of Ser. No. 134,793, April 16, 1971, Pat. No. 3,773,606. This application May 3, 1973, Ser. No. 356,861

Int. Cl. D03d *23/00, 49/00*

U.S. Cl. 139—383 R **1 Claim**



1. A method of manufacturing a preformed fabric of cross-laid yarns comprising:

a. feeding from about 10 to 30 warp yarns to each outer portion of a loom;

b. drawing said yarns through the loom along each outer portion thereof, while said yarns are maintained under tension;

c. weaving from about 2 to 8 cross yarns per inch with said warp yarns to form a layer of cross yarns having a woven selvage along each longitudinal edge of the layers;

d. diverging said selvages from each other to apply tension to said cross-laid yarns and;

e. rolling the layer on itself to form a roll of a preformed fabric of cross-laid yarns.

3,860,046

GOSSAMER SHOULDER STRAP FOR BRASSIERES

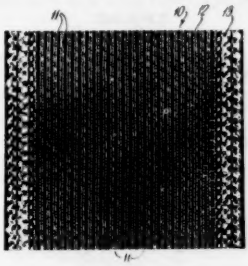
Richard E. Goff, Jr.; Joseph A. Priestley, both of Barrington, and Thomas L. Staffier, Pawtucket, all of R.I., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Jan. 2, 1973, Ser. No. 320,230

Int. Cl. D03d *15/08*

U.S. Cl. 139—421 **7 Claims**

1. A diaphanous narrow woven fabric having stretch properties suitable for use as a shoulder strap for brassieres consisting of: a set of filling yarns and a set of warp yarns woven together, said filling yarns selected from the class consisting of monofilament nylon yarns, monofilament polyester yarns, and monofilament polypropylene yarns, said filling yarns having a denier of at least 70 to maintain fabric wall stability, and no greater than 250 to provide the diaphanous effect, and said fabric containing from 60 to 120 filling yarns per inch so that the fabric has cross-sectional stability and stiffness, the center portion of the set of warp yarns comprising elastic yarns, said elastic yarns having an elastic core having a denier of from 420 to 840, said core being wrapped with yarns having a total denier of less than 100, the edge portions of the set of warp yarns comprising a plurality of texturized yarns to provide smooth soft edges in the narrow woven elastic fabric, whereby said narrow woven elastic fabric has a longitudinal elongation



of from 40 percent to 110 percent and a power if the longitudinal elongation is: in the 40 percent to 75 percent range of more than 0.55 pounds and a power if the longitudinal elongation is: in the 75 percent to 110 percent range of more than 0.98 pounds.

3,860,047

APPARATUS FOR FLUSHING OXYGEN FROM BULK MATERIALS TO BE PACKAGED

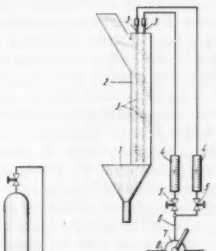
Hans-Joachim Finkelmeier, Fellbach; Klaus Domke, Hirschlanden, and Peter Lau, Asperg, all of Germany, assignors to Fr. Hesser Maschinenfabrik AG, Stuttgart-Bad Cannstadt, Germany

Filed Dec. 19, 1973, Ser. No. 426,034

Claims priority, application Germany, Dec. 18, 1972, 2261978

Int. Cl. B65b *31/00*

U.S. Cl. 141—47 **5 Claims**



1. In a packaging machine, an apparatus for flushing oxygen from bulk material which is to be measured and packaged comprising:

measuring means adapted for receiving the bulk material;

a bulk material supply conduit means leading to said measuring unit;

gas supply system including a gas supply tube opening into one of the two above recited means, a gas distributor manifold, a plurality of adjustable throttling valves connected in parallel to said manifold;

gas flow selector means interposed between said supply conduit and said distributor manifold with each of said throttling valves connecting individually to said selector means and said gas supply tube flow connecting to said

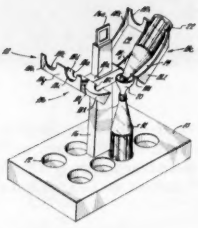
selector, said selector being effective to connect exclusively any one of the said throttling valves to said supply tubes.

3,860,048

BOTTLE DRAINING RACK

Marvin White, 15520 Tustin Village Way, Apt. No. 53, Tustin, Calif. 92680

Filed Nov. 13, 1972, Ser. No. 306,009
Int. Cl. B65b *3/06*
U.S. Cl. 141—375 **4 Claims**



1. A rack for supporting bottles containing a viscous material such as ketchup in a manner to facilitate transferring or draining the material from an emptying bottle to a receiving bottle comprising:

a base for resting on a supporting surface;

a vertical support column extending upwardly from the base said column having a cross-section which tapers from a smaller upper end to a larger lower end; and

a bottle support member having a central collar with a central opening having a cross-section shaped similarly to the column and being larger than the upper end of the column and smaller than the lower end so that the collar fits easily onto the upper end of the column and is supported on the column by interferences between the collar and the column of a desired height above the base, said collar having a pair of arms extending outwardly from opposite sides of the collar, each arm having a pair of yokes for supporting a bottle with its open end extending downwardly at an angle such that its contents will flow out by gravity, one yoke being adapted to engage the neck of the bottle near its open end and the other yoke being adapted to receive a larger diameter portion of the bottle near its closed end, the bottle support member being constructed such that the open end of the bottle supported by the member is positioned so that a receiving bottle having a funnel in its open upper end may be positioned below and aligned with the open end of the supported bottle and with the open end of the supported bottle extending into the funnel so that the material flow is interrupted when the level of material in the funnel is above the open end of the emptying bottle.

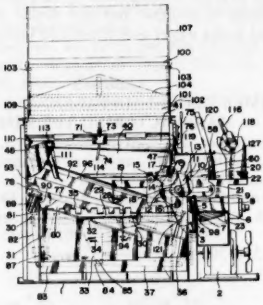
3,860,049

PENCIL SHARPENER

Shigeaki Kuramochi, No. 24-17, Koishikawa 5-chome, Bunkyo-ku, Tokyo, Japan

Filed May 31, 1973, Ser. No. 365,610
Claims priority, application Japan, Sept. 7, 1972, 47-89846
Int. Cl. B23l *23/02*
U.S. Cl. 144—28.72 **2 Claims**

1. A pencil sharpener comprising a sharpening blade, a feed member for feeding a pencil to said sharpening blade and for moving a sharpened pencil from the sharpening blade in association with a sharpening operation of the sharpening blade, a guide member disposed in said feed member for tilting about an axis normal to the length of the feed member for guiding a pencil toward the sharpening blade in association with the operation of the feed member and for pivoting about an axis parallel to the length of the guide member, for guiding a sharpened pencil to be discharged from the pencil sharpener, an inclined guide surface for guiding pencils to said guide member, a regulating plate pivotally mounted for feeding to said guide member in association with a pencil sharpening



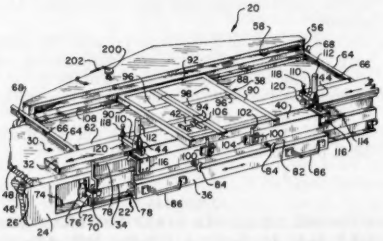
operation the pencils supplied to said inclined guide surface, a feed actuator having a pencil holding passage for pivoting in association with a pencil sharpening operation for guiding pencils to said guide surface, a vibratory plate for supplying pencils to said feed actuator, and a pivotal lever engaged by said vibratory plate, said feed actuator having serration-like irregularities therein for engaging said pivotal lever.

3,860,050

SIGN-MAKING METHOD AND APPARATUS

Donald D. Banks, Ft. Collins, Colo., assignor to Bellbanks, Inc., Denver, Colo.

Filed Jan. 19, 1973, Ser. No. 325,052
Int. Cl. B27c *5/10*
U.S. Cl. 144—144.5 **18 Claims**



9. An apparatus for engraving letters or the like in a workpiece comprising in combination,

a work table having an upper flat work surface and a front face;

a support frame mounted on the front face and having a base member and a slide member slidably connected to the base member;

hinge means pivotally connecting the base member to the front face of the work table such that the support frame extends above the work surface a distance slightly greater than the thickness of the workpiece;

set means selectively interconnecting the slide member and the base member for immobilizing the slide member relative to the base member;

a workpiece guide adjustably connected to the work table for extension over the work surface and including a guide member disposed in parallel relation to the front face of the work table defining a path on the work surface and

adjacent said front face in which the workpiece is slidably disposed;

clamp means secured to said slide member and selectively engageable with the workpiece for immobilizing the workpiece relative to the slide member;

a template holder having outer side members affixed at one end to and extending normally away from said slide member in overlying relationship with the workpiece, and an end frame member interconnecting the other ends of said side frame members, each of said side frame members and said end frame member having inwardly opening channels;

template means having a cut-out portion passing therethrough and side edges adapted to be slidably retained in said channels whereby the template means is held in parallel overlying relationship with said workpiece; and

a cutting tool with a cutter blade adapted to selectively extend through said cut-out portion of the template means into cutting engagement with the workpiece, said cutting tool having a guide bushing therein concentric with the cutter blade for guiding movement of the cutting tool along said cut-out portion of the template whereby a portion of the workpiece corresponding in configuration to the cut-out portion of the template can be cut in the workpiece.

3,860,051

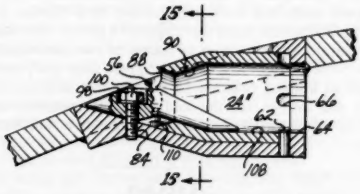
CHIPPER CUTTER AND HOLDERS THEREFOR

I'Anson Anson, 4014 Hunts Point Rd., Bellevue, Wash. 98004

Division of Ser. No. 75,154, Sept. 24, 1970, Pat. No. 3,675,693. This application May 8, 1972, Ser. No. 251,519

Int. Cl. B27l *11/02*

U.S. Cl. 144—172 **26 Claims**



1. A rotary chipper drum having a series of cutter knives on the cylindrical cutter surface thereof, each of which projects relatively outwardly from the surface of the drum, and has an arcute cutting edge thereon, the relatively concave face of which is described by a conical surface of revolution.

3,860,052

CORDLESS VEHICLE TIRE

Herman E. Schroeder, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 11, 1972, Ser. No. 217,033

Int. Cl. B60c *3/00*

U.S. Cl. 152—354 **10 Claims**

1. A cordless vehicle tire comprising a copolyetherester elastomer sidewall adhered to a tread consisting essentially of an ethylene/propylene/non-conjugated diene copolymer, said copolyetherester consisting essentially of a multiplicity of recurring long chain ester units and short chain ester units joined head-to-tail through ester linkages, said long chain ester units being represented by the formula

and said short chain units being represented by the formula

where G is a divalent radical remaining after the removal of terminal hydroxyl groups from a poly(alkylene oxide) glycol having a number-average molecular weight of about 600–3,000 and a carbon-to-oxygen atomic ratio of about 2.0–4.3; R is a divalent radical remaining after removal of carboxyl groups from a dicarboxylic acid having a molecular weight less than about 300 and D is a divalent radical remaining after removal of hydroxyl groups from a diol having a molecular weight less than about 250; provided,

a. said short chain ester units amount to about 35–95 percent by weight of said copolyester,

b. at least about 70 percent of the R groups in formulae (I) and (II) are 1,4-phenylene radicals and at least about 70 percent of the D groups in formula (II) are 1,4-butylene radicals, and

c. the sum of the percentages of R groups in formulae (I) and (II) which are not 1,4-phenylene radicals and of D groups in formula (II) which are not 1,4-butylene radicals does not exceed about 30 percent.

3,860,053

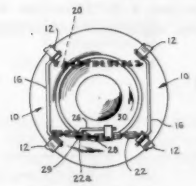
SNOW GRIPPER FOR A VEHICLE TIRE

Jostein Hatten, Trysil, Norway, and Ole H. Johnsen, Greenwich, Conn., assignors to Nordic International Co., Greenwich, Conn.

Filed Mar. 21, 1973, Ser. No. 343,202

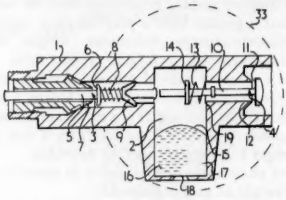
Int. Cl. B60c *27/20*

U.S. Cl. 152—226 **8 Claims**



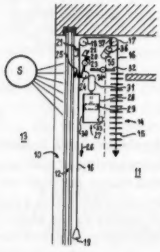
1. A snow gripper device for a vehicular tire comprising a plurality of snow plates having a relatively flat road-contacting surface provided with raised portions and arranged at spaced locations on the tire periphery and extending across the tire substantially at right angles to the plane of said tire, a spaced pair of rigid rods connecting adjacent snow plates and extending along the front and rear sidewalls, respectively, of the tire to form a self-supporting snow gripper unit, a first non rigid and non-stretchable connection between snow gripper units on said tire being located behind said tire and engaging the adjacent back sidewall, and a second non-rigid and non-stretchable adjustable connection between said snow gripper units being positioned in front and engaging the front sidewall to firmly hold said device thereon, and in one position of the tire one of said connections is located adjacent to the top of the tire and the other connection is located adjacent to the bottom of the tire in a diagonal plane.

3,860,054
VALVE ASSEMBLIES
Frederick Vernon Prottey, Walsall, England, assignor to Dunlop Limited, London, England
Filed Nov. 20, 1972, Ser. No. 307,949
Claims priority, application Great Britain, Dec. 2, 1971, 55884/71
Int. Cl. B60b 29/00
U.S. Cl. 152—415 12 Claims



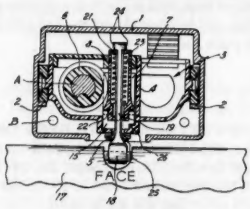
1. A valve assembly for the inflation of a pneumatic tire and the dispensing of lubricant for the interior surface of the tire comprising a housing, a control chamber incorporated in said housing, said chamber having inlet and outlet valves, the inlet and outlet valves being arranged to be either both closed to seal the control chamber or both open to allow the passage of air through the control chamber to the interior of an associated pneumatic tire thereby ensuring that the control chamber and the interior of the tire are at substantially the same pressure when the desired tire pressure is reached, and a pressure sensitive device arranged to respond to pressure differentials between the control chamber and the interior of the associated pneumatic tire and to release lubricant into the interior of the tire when the pressure in the control chamber exceeds that in the interior of the associated pneumatic tire by a predetermined amount.

3,860,055
SHUTTER DEVICE
Ernst Wild, Stafa, Switzerland, assignor to Stafa Control System AG, Stafa, Switzerland
Filed June 4, 1973, Ser. No. 366,711
Claims priority, application Switzerland, June 22, 1972, 9409/72
Int. Cl. E05f 15/20
U.S. Cl. 160—1 13 Claims



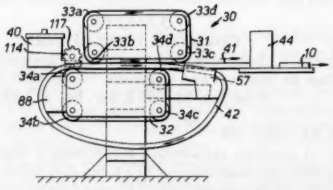
1. A shutter device incorporating a shutter and a mechanism for raising and lowering the shutter, the improvement comprising feeler means sensitive to the external thermal- and light radiation, the feeler means being operatively coupled with the raising and lowering mechanism in order to trigger the raising and lowering mechanism, upon exceeding a predetermined radiation intensity, for the purpose of lowering the shutter, said mechanism including a blockable manual draw device for raising the shutter against its own weight, the feeler means comprising a transducer element containing an expansible material and arranged at the outside of the shutter, said transducer element incorporating an actuation element movable in direct response to the thermal expansion of the expansible material, said actuation element cooperating directly with said blockable manual draw device so that upon movement of said actuation element in response to the thermal expansion of the expansible material there can be directly released the blocking of the manual draw device due to the direct coaction of said actuation element therewith.

3,860,056
VERTICAL BLIND
Paul Bruneau, Checy, France, assignor to Societe Dite: Franciaflex, Checy, France
Filed Jan. 16, 1974, Ser. No. 433,856
Claims priority, application France, Jan. 17, 1973, 73.01533
Int. Cl. E06b 9/26
U.S. Cl. 160—176 5 Claims



1. A window blind comprising a horizontal section carrying and guiding displaceable carriages each of which supports a slat by means of a pivotable hook connected to a vertical pinion arranged to mesh with a horizontal worm screw, wherein each said hook is connected to a circular pivotable member separate from the respective pinion and adapted to co-operate with the latter by means of cam surfaces disposed in a plane at right angles to the pivot axis, the pinion being urged by a spring towards the position in which it co-operates with and thus drives the said pivotable member, the latter having arrestor stops for co-operating with a stationery radial cog.

3,860,057
METHOD AND APPARATUS FOR CONTINUOUS METAL CASTING
Thomas William Garlick, 4 Bloomsbury Sq., London, England
Filed Mar. 8, 1973, Ser. No. 339,362
Claims priority, application Great Britain, Mar. 10, 1972, 11334/72; Mar. 30, 1972, 15104/72
Int. Cl. B22d 11/06
U.S. Cl. 164—87 21 Claims



1. Molten metal casting apparatus comprising an endless supporting belt and movable edge dams defining between them and with the belt a casting region for a continuously cast

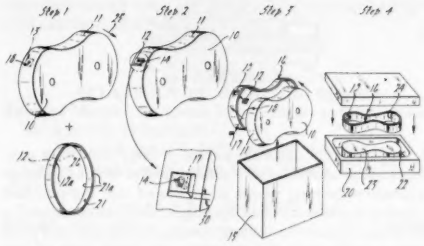
strip, the edge dams each having a laterally shouldered section to enable the integral formation of a supporting shoulder on each side of the cast strip.

3,860,058

METHOD OF FORMING DIMENSIONAL HOLES IN THE WANKEL ROTOR HOUSING ELECTROFORM

William A. Donakowski; John R. Morgan, both of Dearborn Heights, and Karl Roemming, Detroit, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 5, 1973, Ser. No. 413,156
Int. Cl. B22d *19/00, 19/08*
U.S. Cl. 164—101 **9 Claims**



1. A method of fabricating a rotor housing for a rotary internal combustion engine, comprising:

a. forming a mandrel having an electrolytically conductive surface, and forming an insert having a thickness greater than a subsequent electrolytic deposit on said mandrel, said insert having a face formed as a mirror image of one area of said mandrel surface,

b. assembling said insert to said mandrel at said one area and securing said assembly to effect a water-type seal therebetween,

c. electrodepositing a wear-resistant metal-carbide composite onto said mandrel surface having a thickness substantially equivalent to but less than said insert,

d. removing said securement retaining said insert to said mandrel, stripping said electrolytic transfer coating from said mandrel, and removing the insert from the transfer coating, and

e. placing said stripped transfer coating in a die-cast machine and casting a substrate metal therearound to complete said rotor housing, said housing having at least one channel with a throat dimensionally equal to and in communication with the opening of said transfer coating.

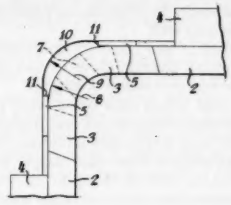
3,860,059

METHOD AND APPARATUS FOR CASTING INGOTS

Ralf Ageborg, and Jan Olof Beckman, both of Aktiebolaget, Sweden, assignors to Foseco International Limited, Birmingham, England

Filed Mar. 26, 1973, Ser. No. 344,597
Claims priority, application Norway, Mar. 27, 1972, 1042/72
Int. Cl. B22d *7/10, 29/00*
U.S. Cl. 164—131 **8 Claims**

1. An ingot mould having a hot top formed of a lining of heat-insulating refractory material, and a plurality of metal plates located between each of the side walls of the ingot mould and the lining, said lining being horizontally spaced from the corner walls to provide vertical gaps between the mould wall and the lining at each corner, adjacent ends of said metal plates extending into said corner gaps whereby during



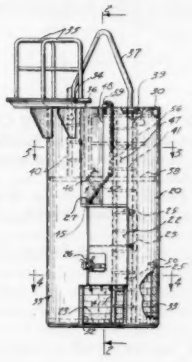
casting, molten metal may flow up into said gaps and substantially weld itself to said adjacent ends of said plates.

3,860,060

LADLE MAINTENANCE SAFETY CAGE

June H. Reighart, 6809 Mayfield Rd., Mayfield Heights, Ohio 44124

Filed Oct. 11, 1972, Ser. No. 296,637
Int. Cl. B22d *41/10*
U.S. Cl. 164—152 **6 Claims**



1. A ladle maintenance safety cage for protecting a human operator from the heat of a ladle used for molten metal and having a nozzle in its bottom and a stopper rod controlling said nozzle, said cage comprising,

a steel shell adapted to be inserted into said ladle,

a heat insulation lining within said shell,

a vertical opening in one side of said cage extending from the top of said cage to the bottom of said cage,

a stopper rod setting well in said one side of said cage and adapted to accommodate the stopper rod in said ladle,

said well extending from the top of said cage to a point spaced from the bottom thereof, and comprising spaced vertical side walls extending inwardly from opposite edges of said vertical opening,

the lower portion of said vertical opening forming an access door opening extending from the lower end of said well to the bottom of said cage,

a working notch in the bottom of said cage communicating with the lower end of said vertical opening and providing means through which an operator within said cage may have access to said nozzle in said ladle,

an access door mounted in said door opening including a hinge along a vertical edge thereof pivotally connecting said access door to said shell to enable said access door to be swung inwardly into said shell,

said access door extending from the lower end of said well to a point spaced above the bottom edge of said cage,

a cover at the bottom of said well, said cover being hinged to one of the walls of said well and being adapted to be swung downwardly to a horizontal position to close the lower end of said well,

means connected to said cover for maintaining it while in the fully opened position close to and parallel to the vertical side wall to which it is hinged,

said hinge on said access door being offset from the adjacent vertical edge of said access door and offset from said shell whereby said access door is disposed entirely within said shell and entirely clears said stopper rod setting well when said access door is swung to its open position to avoid any obstruction within said cage which might interfere with the removal of a burned-out stopper rod or the setting of a new stopper rod in said ladle,

said cover is hinged adjacent one edge to said one wall of said well adjacent to the bottom edge of said one wall,

said wall to which said cover is hinged has an opening,

said means connected to said cover for maintaining it while in the fully opened position comprises a flexible member connected to said cover at a point remote from said hinged edge, and

said flexible member extends through said opening and upwardly being accessible to an operator at a point near the top of said cage enabling said cover to be raised by said operator into a positioning in contact with or close proximity to said one wall from a position near the top of said cage.

3,860,061

ARRANGEMENT AT A CONTINUOUS CASTING PLANT

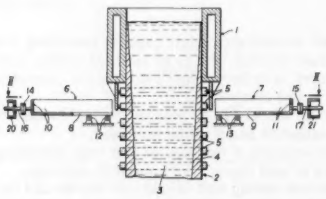
Otto Hoyer, Linz, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed July 5, 1973, Ser. No. 376,737

Claims priority, application Austria, Aug. 17, 1972, 7095/72

Int. Cl. B22c *19/04*

U.S. Cl. 164—153 **1 Claim**



1. An apparatus for use in a continuous casting plant for the continuous casting of steel bars in which a cast bar having a liquid core and a solidified bar shell is cast in a downward direction from a water cooled mould, comprising a container positioned below the mould and adapted to substantially surround the bar shell, said container being open at its top to receive liquid metal in the event that the liquid metal breaks through the bar shell and having at least two parts which are horizontally displaceable relative to each other, and means for horizontally displacing the parts of the container relative to the bar shell.

3,860,062

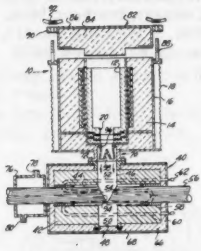
METHOD AND APPARATUS FOR JOINING THE ENDS OF ALUMINUM CONDUCTORS BY CASTWELDING

William C. McMurray, St. Clair Shores, and Mitchell D. Charneski, Southfield, both of Mich., assignors to The Detroit Edison Company, Detroit, Mich.

Filed Jan. 2, 1973, Ser. No. 320,105

Int. Cl. B22d *37/00*

U.S. Cl. 164—333 **4 Claims**



1. Apparatus for castweld joining of large aluminum conductors which comprises an insulated pot for melting a charge of aluminum, heating means incorporated into the pot, said pot having a gate-controlled opening at the bottom thereof, a mold directly below the bottom opening in said pot, said mold having a mold cavity for receiving the bared ends of two conductors to be joined by castwelding, a well extending downwardly from said cavity, means for locating the conductor ends in position such that melted aluminum discharged from said pot flows over them and into said well, and a riser passage extending upwardly from said mold cavity, in which said heating means comprises electrical resistance heating elements operable at low commercial voltages to melt aluminum in said pot, said mold cavity being defined by the intersection of a vertical cylindrical opening, the lower portion of which forms said well and the upper portion of which forms said riser passage, and a horizontal cylindrical opening, the portions of which adjacent said vertical opening are slightly larger than the conductors to be joined to provide for a flow of melted aluminum along the outer surface of said conductors, said mold comprising a two-piece metal block having said horizontal and vertical openings therein, the division between the two pieces of said block being in a vertical plane bisecting said horizontal and vertical openings, and mold preheating means comprising low voltage electric heating elements incorporated therein, said mold having mold cooling means comprising flow passages therein for receiving a fluid coolant to accelerate solidification of molten aluminum after pouring the molten aluminum into said mold, and means for circulating the coolant through said flow passages.

3,860,063

MOISTENING DEVICE

Valerio Giordano Riello, Legnago, Italy, assignor to Riello Condizionatori S.A.S. di Giordano Riello & C., Bevilacqua, Verona, Italy

Filed Dec. 11, 1972, Ser. No. 314,276

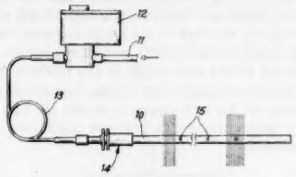
Claims priority, application Italy, Dec. 11, 1971, 32273/71

Int. Cl. F24f *3/14*

U.S. Cl. 165—60 **1 Claim**

1. In a heat exchanger with a humidifier, a combination comprising support means comprising at least two spaced plates; a plurality of substantially parallel pipes connected in series to each other for passage of a heat-exchange medium therethrough, said pipes extending between and being supported by said plates; a water delivery pipe formed with a plurality of perforations, said water delivery pipe being arranged substantially parallel to and betwen said plurality of

pipes and being supported by at least one of said plates; means for feeding water into said water delivery pipe so that such water is sprayed through said perforations on at least some of said plurality of pipes; capillary tube means for controlling the



amount of water fed into said water delivery pipe so that the moisture content of the ambient atmosphere is maintained at a predetermined value and valve means communicating with said capillary tube means.

3,860,064

RELATING TO GAS-MOVING DEVICE

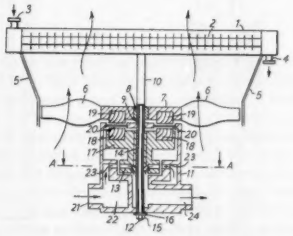
Edmund Murphy, La Spezia, Italy, assignor to Ruckluft Patent AG, Lucerne, Switzerland

Filed Apr. 13, 1973, Ser. No. 350,759

Claims priority, application Great Britain, May 12, 1972, 22524/72

Int. Cl. F24h *3/06;* **H02k** *5/10*

U.S. Cl. 165—121 **7 Claims**



1. A gas moving apparatus comprising a rotatable fan; a fluid casing; a shaft fixed to and extending in said casing; a fluid operated driver having a driving member mounted for rotation on said shaft and within said casing; a magnetic coupling for transmitting drive from said driving member to said fan, said coupling including a first coupling element operatively connected to said driving member and a second coupling element operatively connected to said fan; and a leak-free wall interposed between said first and second elements and closing one end of said casing, said shaft extending through and projecting beyond said leak-free wall, and said fan being mounted for rotation about the projecting part of said shaft.

3,860,065

DISTRIBUTOR FOR PLATE TYPE HEAT EXCHANGER HAVING SIDE HEADERS

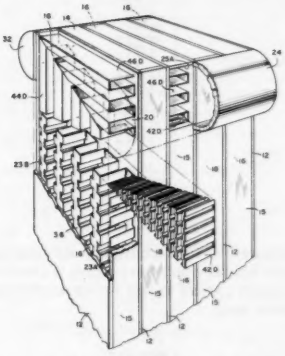
James J. Schauls, La Crosse, Wis., assignor to The Trane Company, La Crosse, Wis.

Continuation-in-part of Ser. Nos. 26,624, April 8, 1970, abandoned, and Ser. No. 128,909, March, 1971, abandoned. This application June 5, 1972, Ser. No. 259,744

Int. Cl. F28f *3/00*

U.S. Cl. 165—166 **16 Claims**

1. In an elongated plate type heat exchanger having a plurality of elongated plates of generally similar peripheral configuration contraposed in spaced substantially parallel relationship wherein the distances between adjacent plates individually are substantially less than the width of said plates thereby defining a plurality of relatively thin spatial layers therebetween, sealing means sealingly bridging between and extending along the margins of adjacent plates whereby said spatial layers are substantially enclosed to define a plurality of elongated passages each having a thickness less than its width and a width less than its length at least one of said passages having first and second longitudinal edges spaced by the width of said one passage and first and second end edges spaced by the length of said passage, said one passage having an inlet and outlet openings for ingress and egress of a heat exchange fluid, one of said openings being a port communicating with said one passage through said first longitudinal edge adjacent said



first end edge of said one passage, and metallic corrugated sheet fin material extending substantially throughout said one passage between said inlet and outlet openings; the improvement comprising: an improved fluid distributor wherein said fin material includes an elongated wedge section of said material having its longest extent extending transversely of the flow path in said one passage and having its wider end terminating adjacent to said port and longitudinally inwardly of said one passage beyond said port at said first longitudinal edge; said section having a comparatively higher resistance to fluid flow therethrough per unit length in the direction of fluid flow than the average resistance to fluid flow per unit length in the direction of fluid flow for the remainder of said fin material in said one passage.

3,860,066

SAFETY VALVES FOR WELLS

Joseph L. Pearce; Phillip S. Sizer, and Donald F. Taylor, all of Dallas, assignors to Otis Engineering Corporation, Dallas, Tex.

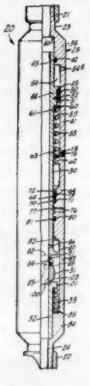
Continuation-in-part of Ser. No. 238,397, March 27, 1972, abandoned. This application Oct. 27, 1972, Ser. No. 301,525

Int. Cl. E21b *33/03, 43/12*

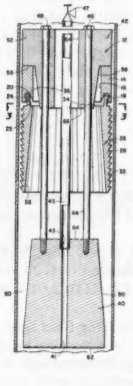
U.S. Cl. 116—72 **27 Claims**

1. A device for controlling fluid flow in a flow conductor of a well comprising: a valve housing having a longitudinal bore defining a flow passage therethrough; means for communicating control fluid pressure to said device; valve means supported in said housing adapted to be opened and closed to control fluid flow through said housing; valve operator means supported for longitudinal movement in said housing and operatively connected with said valve means for opening and closing said valve means, said operator means having a longitudinal flow passage communicating with said flow passage through said housing; means for applying a force to said operator means for biasing said operator means in a direction to close said valve means; pressure responsive valve opening and holding means operatively connected with said operator

means for biasing said operator means toward a position to hold said valve means open responsive to a first control fluid pressure level; and means between said housing and said operator means operative responsive to a second higher control fluid pressure level for deactivating said valve opening and holding means whereby said valve means is closed when control fluid pressure applied to said device exceeds said second higher pressure level.

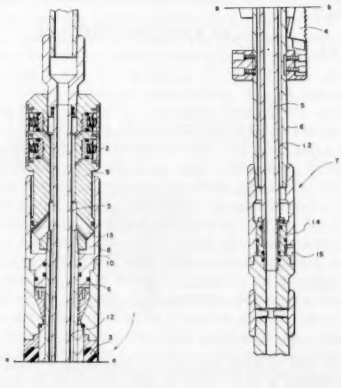


3,860,067
BLOW OUT PREVENTER
Fletcher Rodgers, 129 Santa Fe, Alva, Okla. 73717
Filed Aug. 10, 1973, Ser. No. 387,438
Int. Cl. E21b *33/12, 23/00*
U.S. Cl. 166—121 **6 Claims**



1. A blow out preventer for fluid producing wells having a well casing disposed therein and comprising a locking wedge assembly disposed within the well casing and selectively engagable therewith, means anchored in the well casing for supporting the locking wedge assembly therein, pressure responsive ram wedge means suspended within the well casing in a normal position with respect to the locking wedge assembly for precluding interference with the normal fluid producing operation of the well and movable to a sealing and locking position with respect to the locking wedge assembly upon a pressure surge in the well casing therebelow, release knockout means disposed in the well casing above the locking wedge assembly and independently movable with respect thereto for selectively releasing the ram wedge from the sealing engagement with the locking wedge assembly, said locking wedge assembly including a plurality of circumferentially spaced slip members hingedly secured to the anchoring means for alternate radially outward and radially inward movement, said slips being engagable by the ram wedge in one position thereof for radially outward movement into biting engagement with the inner periphery of the well casing to secure the ram wedge in the sealing position during high pressure conditions in the well casing therebelow.

3,860,068
WELL PACKER ZONE ACTIVATED VALVE
David Lewis Abney, Stafford, and Robert Carl Williams, Spring, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.
Filed Nov. 1, 1973, Ser. No. 411,984
Int. Cl. E21b *23/00, 33/12*
U.S. Cl. 166—120 **7 Claims**



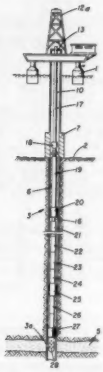
1. A well packer for use in an underground formation penetrated by a borehole, said well packer comprising:
an elongated tubular inner mandrel adapted to be connected into a string of well tubing and having an internal bore passage therein;
hydraulic actuation means attached to said mandrel;
external housing means located concentrically on said inner mandrel;
resilient packer means on said housing means arranged to be compressed longitudinally and expanded radially by said hydraulic actuation means;
anchor slip means on said housing means adapted to be urged outward and grip the well casing wall in response to said hydraulic actuation means;
valve assembly means on said well packer adapted to receive pressure from said inner mandrel bore passage and further adapted to receive pressure from the well formation below said resilient packer means; and
said valve assembly means arranged to respond to the higher of said formation pressure and said inner mandrel pressure and to communicate said higher pressure to said hydraulic actuation means.

3,860,069

METHOD FOR TESTING OIL WELLS

Gary Q. Wray, and John C. Holden, both of Drawer 1431, Duncan, Okla. 73533

Division of Ser. No. 335,980, Feb. 26, 1973, abandoned. This application Feb. 19, 1974, Ser. No. 443,599
Int. Cl. E21b 43/00, 47/00, 49/00
U.S. Cl. 166—264 1 Claim



1. A method of sampling an underground formation which is intersected by a fluid bore hole extending from the surface to the formation with a test string containing a bias-closing means within an annulus pressure operated power actuating means which is operable to open and close a sampler attached to said power actuating means, comprising the steps of:

placing said test string in said fluid filled borehole;

providing an open flow channel between said bias-closing means in said annulus pressure operated power actuating means and the annulus surrounding said test string when said test string is positioned in an upper portion of said borehole;

lowering said test string into said borehole downwardly from said upper portion until said power actuating means and said attached sampler is in the vicinity of the formation to be tested;

concurrent with said lowering step, utilizing the pressure of fluid in the annulus adjacent said annulus pressure operated power actuating means to supplement said bias-closing means thereby preventing operation of said sampler;

isolating said formation from the annulus area surrounding said power actuating means whereby pressure increases in the fluid in said annulus area will not affect the pressure in said formation;

closing said flow channel between said bias-closing means and said annulus;

increasing the pressure of said fluid in said annulus area to a first predetermined level sufficient to overcome said supplemented bias-closing means, thereby opening said sampler and allowing formation fluid to flow through said test string;

additionally increasing the pressure of said fluid in said annulus area above a second predetermined level sufficient to further overcome said supplemented bias-closing means, and to close said sampler thereby trapping a fluid sample; and

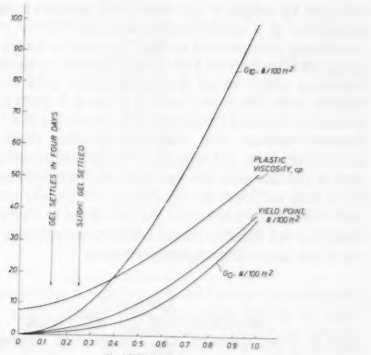
locking said sampler in the closed position in response to said additional pressure increase.

3,860,070

ALUMINATE-THICKENED WELL TREATING FLUID AND METHOD OF USE

John A. Herce, Bellaire, Tex., and Robert N. Tuttle, Metairie, La., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 13, 1973, Ser. No. 424,397
Int. Cl. E21b 33/138, 43/26
U.S. Cl. 166—292 12 Claims



1. A process for temporarily plugging a subterranean reservoir, which process comprises:

compounding a metal hydroxide-thickened aqueous fluid containing enough water-soluble salt of an amphoteric metal and enough watersoluble base to form a viscosity-increasing proportion of gelatinous hydrated metal oxide and provide a pH that is relatively non-corrosive to ferrous metal;

adjusting the specific gravity and fluid loss prevention properties of the fluid relative to the depth and fluid pressure of the reservoir to the extent required to provide a hydrostatic head that at least counter-balances the reservoir fluid pressure and a fluid loss prevention property that substantially prevents loss into the reservoir; and

flowing the so-adjusted fluid into the well to form a column of fluid extending from a near-surface location to the depth of the reservoir.

7. A fluid composition that temporarily plugs a subterranean reservoir when it is positioned so that it forms a column of fluid extending between the reservoir and a near surface location, which composition comprises:

a metal hydroxide-thickened aqueous fluid that contains enough water-soluble salt of an amphoteric metal and enough water-soluble base to provide, within said aqueous fluid, both a viscosity-increasing proportion of gelatinous hydrated metal oxide and a pH that is relatively non-corrosive to ferrous metal; and

within said aqueous fluid, a combination of specific gravity and fluid loss prevention properties that are correlated relative to the depth and fluid pressure of said reservoir to provide a hydrostatic head that at least counter-balances the reservoir fluid pressure and a fluid loss prevention property that substantially prevents fluid loss into the reservoir when the aqueous fluid is positioned so that it forms a column of fluid extending from the reservoir to a near surface location.

3,860,071

METHOD FOR STIMULATING WELL PRODUCTION

Jack F. Tate, and Jim Maddox, Jr., both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,551
Int. Cl. E21b *43/26, 43/27*
U.S. Cl. 166—307 14 Claims

1. A method of increasing the production of fluids from a subterranean fluid-bearing formation having present therein acid-soluble components comprising injecting down the well bore penetrating said formation and injecting therefrom into said formation under a pressure greater than the formation pressure, an aqueous acidic solution containing from about 0.5 to about 15percent by weight of a mineral acid having an admixture therein in an amount of from about 0.0005 to about 1 percent by weight, said admixture being formed from about one part by weight of (A) a member selected from the group consisting of a sulfated/sulfonated polyethoxy alkyl phenol containing from about 8 to about 14 carbon atoms in the alkyl group and from about 4 to about 10 ethoxy groups, the corresponding alkali metal and ammonium salts and mixtures thereof, with (B) from about 1 to about 3 parts by weight of a member selected from the group consisting of a C_8–C_{14} alkyl benzene sulfonic acid, the corresponding alkali metal and ammonium salts and mixtures thereof, maintaining said solution in contact with the formation and production equipment for a time sufficient for the acid to chemically react with the acid-soluble components of the formation to etch passageways therethrough thereby increasing substantially the flow capacity of the said subterranean formation.

3,860,072

METHOD FOR OIL RECOVERY

Jack F. Tate, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,549
Int. Cl. E21b *43/26*
U.S. Cl. 166—308 10 Claims

1. Method of increasing and sustaining the production of fluids from a subterranean fluid-bearing formation comprising injecting down the well bore penetrating said formation and injecting therefrom into said formation under a pressure greater than the formation pressure, an aqueous solution containing a surfactant admixture, said admixture being formed from about one part by weight of (A) a member selected from the group consisting of a sulfated/sulfonated polyethoxy alkyl phenol, containing from about 8 to about 14 carbon atoms in the alkyl group and from about 4 to about 10 ethoxy groups, the corresponding alkali metal and ammonium salts and mixtures thereof, with (B) from about 1 to about 3 parts by weight of a member selected from the group consisting of a C_8–C_{14} alkyl benzene sulfonic acid, the corresponding alkali metal and ammonium salts and mixtures thereof.

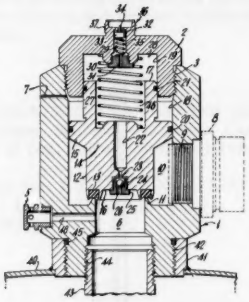
3,860,073

FIRE EXTINGUISHER DISCHARGE VALVE

Charles F. Willms, Rutherford, N.J., assignor to Norris Industries, Inc., Los Angeles, Calif.

Filed Jan. 25, 1974, Ser. No. 436,797
Int. Cl. F16k *31/12*
U.S. Cl. 169—20 10 Claims

1. A fire extinguisher discharge valve adapted to be attached to the outlet of a container for fire extinguisher fluid, said discharge valve comprising a housing having an inlet and an outlet with a main fluid passage therebetween, a main valve seat defining inlet and outlet portions of said main fluid passage and facing said outlet portion, a main valve member adapted to engage said main valve seat from the outlet portion, a front and rear faced two diameter piston member integral with said main valve member, said front face having outer and central portions, said main valve member forming said central portion, two diameter cylinder means in said housing on the outlet side of said main valve seat, said two diameter piston sealingly and slideably mounted in said two diameter cylinder for movement of said main valve member against and away from its seat, the area of the rear face of said piston member greater than the area of said main valve seat, the area of said front face outer portion of greater area than said area of said rear face, pressure equalizing fluid passage means leading from the front face of said piston member to the rear face thereof so that said piston member is normally urged into main valve closing position by the pressure of fluid in said inlet passage, fluid passage valve seat means about said



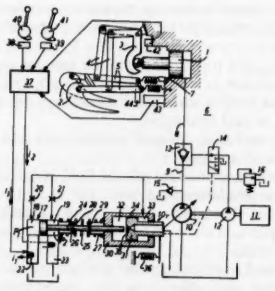
pressure equalizing fluid passage means directed towards said inlet passage, and a normally open valve member for said fluid passage valve seat, said main valve member adapted to be held against its seat by fluid pressure on the inlet applied through said pressure equalizing fluid passage against said rear face of said piston, said main valve member adapted to be opened by fluid pressure introduced into said outlet portion of said main fluid passage and acting against said front face of said piston member outwardly of said main valve member for the unseating thereof.

3,860,074

ELECTRO-HYDRAULIC DEVICE FOR LIFTING TRACTOR-DRAWN AGRICULTURAL IMPLEMENTS

Roger Maistrelli, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt, France

Filed Feb. 15, 1973, Ser. No. 332,628
Claims priority, application France, Feb. 17, 1972, 72.05366
Int. Cl. A01b *63/112*
U.S. Cl. 172—7 12 Claims



1. An electro-hydraulic apparatus for lifting tractor-drawn agricultural implements, comprising:

coupling means for coupling a tractor-drawn agricultural implement to a tractor;

at least one resilient member fixed to said tractor and engaging said coupling means and biasing said coupling means toward said tractor;

hydraulic actuating means mounted to said tractor and engaging said implement for moving said implement in a direction opposed to the biasing direction of said resilient member;

a variable output hydraulic displacement pump coupled between said hydraulic actuating means and a main pressurized fluid source;

pump actuating means coupled to said variable output pump for adjusting the output of said variable output pump;

manually operated selector means coupled to said variable output pump for selecting a desired draft effort of said implement;

first sensor means for detecting the actual draft effort of said implement;

second sensor means for sensing the output of said selector means;

means coupled to said first and second sensor means for comparing said selected and detected actual draft efforts and generating a signal proportional to the difference therebetween; and

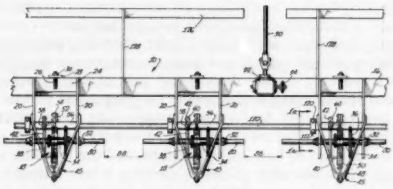
means coupling the output of said comparing means to said pump actuating means to control the output of said variable output pump as a function of the output signal from said comparing means.

3,860,075

ROW CROP ROTARY ROD WEEDER

George H. Morris, Yorkton, Canada, assignor to Morris Rod-Weeder Co. Ltd., Yorkton, Saskatchewan, Canada

Filed Feb. 20, 1973, Ser. No. 334,163
Claims priority, application Canada, Jan. 11, 1973, 161081
Int. Cl. A01b *39/19*
U.S. Cl. 172—44 **10 Claims**



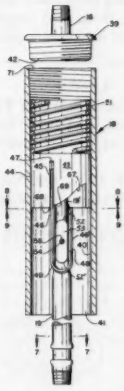
1. In a rotary rod weeder the improvement comprising a main mounting bar extending transverse to a desired line of travel; a plurality of individual rod support means mounted on said main mounting bar, each said support means comprising a mounting portion mounting said support means to said main mounting bar for independent movement therealong, a drive leg portion connected to said mounting portion and pivotable about an axis parallel to said main mounting bar and a single rotary rod journalled in said drive leg portion adjacent a lower end thereof, the rotary rod of one said support means being spaced from the rotary rod of an adjacent support means to permit the unimpeded passage therebetween of a row of a standing crop; rod drive means associated with each said rotary rod and including a drive shaft coaxial with said axis; and tripping means fixed to each said mounting portion and connected to the corresponding drive leg portion, whereby each said drive leg portion can be independently deflected away from an obstruction and then returned to its operating condition once the obstruction has been passed.

3,860,076

COMBINATION JAR AND RELEASING TOOL

Travis B. White, P.O. Box 177, Iraan, Tex. 79744

Filed Aug. 28, 1973, Ser. No. 392,203
Int. Cl. E21b *1/10*
U.S. Cl. 175—294 **12 Claims**



1. In combination, a wireline operated jar and releasing tool comprising a downwardly opening housing having an upper end portion with coupling means formed thereon for connection to said jar, and a lower end portion in the form of a circumferentially extending skirt member; said skirt member forming a piston chamber therewithin;

a piston having an upper face, a lower face, and a circumferentially extending side wall, said piston being reciprocatingly received within said piston chamber, means biasing said piston in a downward direction; means forming opposed longitudinally extending slots in the outer marginal side wall of said piston;

opposed rails extending longitudinally of said housing and affixed to the interior of said piston chamber and skirt member, said rail having an upper end portion and a lower end portion, the lower marginal end of said rail being bent back upon itself to form a "J"; the upper marginal end of said rails being received within said slots; a dog having one end formed into a coupling member for connection to a fishing tool and another end formed into lugs in the form of opposed enlargements, said opposed enlargements being received within said "J" with said coupling member freely extending therefrom;

the lower face of said piston having opposed recesses formed therein to form a cam means so that said lugs can engage said cam means to cause the lugs to be turned out of said "J" when the dog is forced against said piston, thereby releasing the dog from the housing;

said jar comprising an elongate housing having an axial bore longitudinally extending therethrough, upper and lower closure means at each extremity of said axial bore forming an enclosed jar piston chamber, a piston reciprocatingly received within said piston chamber, and dividing the chamber into an upper and a lower chamber, a mandrel affixed to said jar piston, an axial passageway through said upper closure member; seal means on said upper closure member, said mandrel having a marginal length thereof slidably received through said axial passageway in sealing engagement therewith, and a coupling member formed on the free end portion of said mandrel and the free end portion of said housing;

a portion of said lower chamber having an inside diameter which slidably receives said jar piston in close tolerance relationship therein; an upper portion of said jar piston

having an inside diameter larger than the lower portion of said jar piston so that when said jar piston enters said upper portion of said jar piston chamber, a flow path in the form of an annulus is found thereabout;

a check valve, means forming a passageway through said jar piston for enabling flow to occur from said lower chamber, through said jar piston, and into said upper chamber; said check valve being positioned within said passageway for precluding flow from said upper chamber, through said passageway, and into said lower chamber.

3,860,077

ELECTRICAL BALANCE WITH TARING MEANS

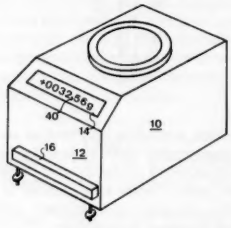
Diethelm Utzinger, Zurich, and Peter Kunz, Meilen, both of Switzerland, assignors to Mettler Instrumente AG, Greifensee, Switzerland

Filed Nov. 19, 1973, Ser. No. 417,397

Claims priority, application Switzerland, Mar. 6, 1973, 3248/73

Int. Cl. G01g *23/14*

U.S. Cl. 177—165 **12 Claims**



1. An electrical balance equipped with a taring means, the improvement comprising a switch element actuatable from externally of the balance and which is operable both to switch the balance on or off and also to initiate a taring operation.

3,860,078

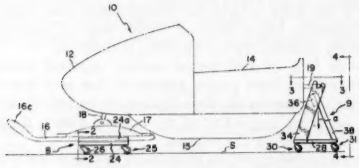
SNOWMOBILE SUPPORT DOLLY

John J. Stoick, 23045 Kirk Rd., Vassar, Mich. 48768

Filed May 31, 1972, Ser. No. 263,396

Int. Cl. B62b *1/06*

U.S. Cl. 180—5 R **6 Claims**



1. Dolly apparatus in combination with a snowmobile having a support portion rigidly connected to its rear portion and a pair of laterally spaced apart longitudinal steering skis at its forward end comprising:

carriage means, reactable between the rear portion of said snowmobile and a surface supporting said snowmobile for lifting said rear portion of said snowmobile off said surface and movably supporting it a spaced distance above the support surface, including:

frame means swingable between a removed position, in which said carriage means can be moved to a remote location, and a snowmobile support position underlying said rear support portion, to move said rear support portion upwardly away from said support surface; and

rolling means supporting said frame means for movement in a swinging path of travel to said support position and for rolling movement, in said support position, on said surface to be traversed;

said frame means including a base frame member a front member extending upwardly and rearwardly from said base frame member and a rear member extending upwardly and forwardly from said base frame member and rigidly connected to said front member, the upper end of said front member providing a pivotal support member for separably engaging said rear support portion of said snowmobile, said rolling means including front and rear roller means engageable with said surface both forwardly and rearwardly of the center of gravity of said dolly apparatus and both forwardly and rearwardly of said pivotal support member when said rear snowmobile portion is supported thereon said pivtoal support member lying in a substantially vertical plane passing substantially midway between said front and rear roller means.

3,860,079

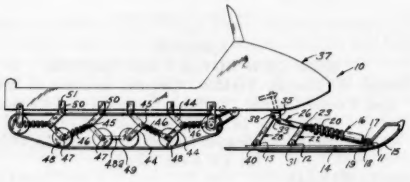
KNEE-ACTION DEVICE FOR SNOW VEHICLES

Elmer Hoffman, 728 Wilson St., Shorewood, Wis. 53066

Filed Sept. 10, 1973, Ser. No. 395,727

Int. Cl. B62m *27/02*

U.S. Cl. 180—5 R **3 Claims**



1. A knee-action device for a snow mobile or snow vehicle, comprising a plate secured to a ski of said vehicle, a plurality of lugs carried by said plate with bolt and nut fastener means securing said lugs to a plurality of links, pivotally carried upon a bracket of said vehicle and pivotally securing a shock absorber assembly to said device, one pair of said lugs being parallel spaced apart and pivotally carrying a rod portion of said shock absorber, said rod portion receiving a bolt fastener which serves and secures said shock absorber assembly at one end to said lugs by nut fastener means, and the opposite end of said shock absorber pivotably carrying a bolt fastener secured between a two sided link which includes an angularly cut end for abutment with said plate and said end of said shock absorber assembly also carrying a two sided link which is pivotably secured to a bracket secured fixedly to said body of said vehicle, said links being secured to said shock absrober assembly and said lugs and bracket by bolt fastener and nut fastener means.

3,860,080

ENDLESS TRACK AND MOUNTING APPARATUS THEREFOR

Harold S. Firstenberg, 131 Townsend St., Redwood City, Calif. 94107

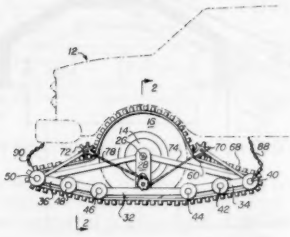
Filed June 21, 1973, Ser. No. 372,220

Int. Cl. B62d *55/04*

U.S. Cl. 180—9.2 R **7 Claims**

1. Track laying apparatus for a vehicle having at least two wheels supported on an axle comprising a rigid frame member, each said wheel having a hub having stud bolts, first means for removably mounting said frame member on the axle for rotation relative to the wheel so that the frame does not rotate with the wheel, said frame member having generally horizontal portions extending forward and rearward of the

wheel, a front sheave journaled on said forward portion and a rear sheave journaled on said rearward portion, an endless flexible member trained around said sheaves and the wheel, said endless member having a first run between said sheaves that is approximately tangent to the periphery of the wheel at the terrain engaging region thereof and a second run between one of said sheaves and a region of the periphery of the wheel remote from the terrain engaging region, means engaging said second run for urging the endless member inward so as to



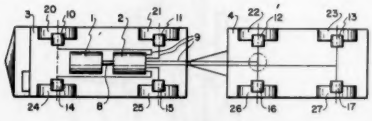
tension the endless member, means for adjusting said urging means, and a plurality of cleats mounted to said endless member and engaged by the wheel in said first run, said cleats being adapted to provide traction on the surface on which the vehicle travels, said first means comprising a flange apertured to be attached to said hub by said stud bolts, a bearing cage assembly fixed to said flange and extending axially outward from said flange, bearings mounted on said bearing cage assembly coaxial with said axle, said frame member having an arm apertured to fit over said bearings.

3,860,081

DRIVE SYSTEM FOR MOTOR VEHICLES, PARTICULARLY FOR TRUCK-TRAILER AND TRUCK SEMI-TRAILER COMBINATIONS

Hans Moll, and Hans Hagen, both of Munich, Germany, assignors to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Munich, Germany

Filed Aug. 22, 1973, Ser. No. 391,153
Int. Cl. B60d *1/08*
U.S. Cl. 180—14 A **4 Claims**



1. A drive system for a truck and trailer or semitrailer combination requiring more than two axles, comprising:

a. an internal combustion engine,

b. an electric generator arranged to be driven by said engine,

c. a plurality of axle-motor units, each unit including an axle and at least one electric motor, each of said axle-motor units being formed as a unitary assembly which can be incorporated in the truck and trailer combination so that the motor drives a wheel of the combination, and which can be removed as a unitary assembly and replaced by another similar unit or by an axle having no motor associated with it, and

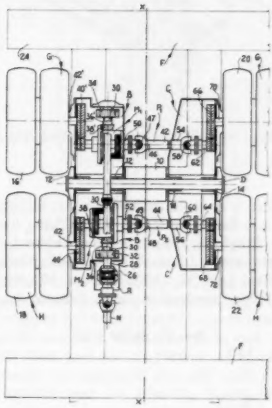
d. means for transmitting electricity from said generator to said motors.

3,860,082

TRANSMISSION SYSTEM FOR DRIVING WHEELS OF HEAVY MOTOR VEHICLES

Guido Testore, Piazzo Ormig, Ovada, Italy

Filed Apr. 2, 1973, Ser. No. 346,796
Claims priority, application Italy, Apr. 12, 1972, 7223/72
Int. Cl. B62d *61/10;* **B60k** *17/36*
U.S. Cl. 180—24.11 **6 Claims**



1. A transmission system for driving wheels of heavy motor vehicles, as e.g. crane trucks, excavators and the like, comprising a pair of oppositely located rigid boxes swingingly fitted, independently from each other, on a common axis secured to vehicle frame and extending perpendicularly to a vehicle longitudinal vertical middle plane, each of said boxes supporting the driving wheels of two wheel trains, on a corresponding vehicle side, said wheels being powered by suitable differential units, that are housed in one of said swinging boxes and driven by a single shaft perpendicular to said box swinging axis, said differential units driving the wheels supported by the box opposite to said one box through suitable cardan joint transmissions or the like, in order to form two mechanical assemblies, each consisting of a swinging box and driving wheels supported therein, that are independently free to swing, within given limits, about said common axis.

3,860,083

DETACHABLE PANEL ARRANGEMENT FOR A TAMPER PROOF ENGINE ENCLOSURE

John William Yancey, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 26, 1973, Ser. No. 327,066
Int. Cl. B62d *25/10*
U.S. Cl. 180—69 R **6 Claims**

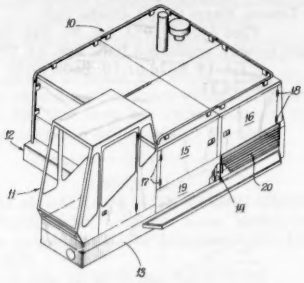
1. An engine enclosure mounted on a mobile vehicle comprising:

a frame, including a support member,

a pair of panels disposed on said frame to have opposed ends thereof positioned closely adjacent to said support member,

fastening means releasably attaching the ends of said panels to said support member, interiorly of said enclosure, and openable access means on said enclosure for selectively exposing said fastening means to facilitate expeditious

removal of said panels, said openable access means comprising a pair of doors each hingedly mounted on said



enclosure, vertically above a respective one of said panels.

3,860,084

GAS CUSHION VEHICLE

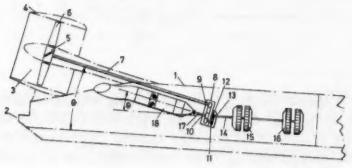
Alan Edgar Bingham, Southampton, England, assignor to Vosper Thornycroft Limited, Portsmouth, England

Filed Aug. 31, 1973, Ser. No. 393,306

Claims priority, application Great Britain, Jan. 12, 1973, 1729/73

Int. Cl. B60r *1/06*

U.S. Cl. 180—117 **7 Claims**



1. A gas cushion vehicle comprising in combination a hull in which is mounted a power plant, at least one lift fan and propulsion means for the vehicle, a gear box having an input from the power plant, the gear box having a first output inclined to the horizontal, which output is directly connected to said propulsion means, and the gear box having a second output directly connected to said lift fan. and said propulsion means comprising a rotor having a rotor axis coaxial with the first output from the gear box.

3,860,085

SOUND SUPPRESSION HOOD ASSEMBLY

Anthony F. Gilbert, Morris Plains, and John H. Munsey, Millington, both of N.J., assignors to Coast Marine Associates, Inc., Dover, N.J.

Filed Feb. 11, 1974, Ser. No. 441,518

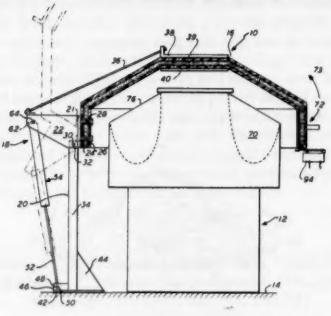
Int. Cl. E04b *1/84*

U.S. Cl. 181—33 K **11 Claims**

1. A sound suppression hood assembly for use in reducing ambient noise levels in the presence of high sound intensity machinery, comprising in combination:

a sound-absorbing hood adapted to cover at least the upper portion of a floor-supported high sound intensity machine;

stand means including an upright and means supporting said upright with respect to said floor, for pivotably supporting said hood with respect to said machine; a pivot assembly being secured between one side of said hood and said stand means; and force biasing means being provided at said stand means and pivot assembly, for counterbalancing said hood weight to facilitate pivoting of said hood back and forth between a first substantially horizontal position at which said hood overlies but is in spaced relationship to said covered machine portion, and a second, open position at which said hood is displaced to a more vertical orientation, to enable access to said ma-



chine by an operator thereof, said upright and said support means for said upright both being positionable to one side of said machine whereby access to said machine is substantially unimpaired when said hood is in said open position, and said stand means being spaceable substantially in its entirety from said machine, whereby direct coupling of machine vibrations to said hood is minimized.

3,860,086

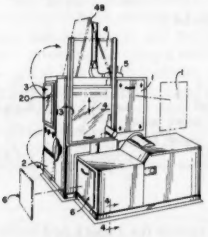
NOISE REDUCTION HOUSING FOR A CAN BODYMAKER

Gautam K. Mahajan, Chicago, and Robert A. Suthard, Woodridge, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Mar. 20, 1974, Ser. No. 452,896

Int. Cl. E04b *1/99*

U.S. Cl. 181—33 K **13 Claims**



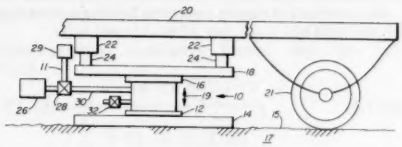
1. In combination with a bodymaker having a can body station with noise producing elements:

an enclosure for said bodymaker having two side walls and having top front and back walls which re formed in part of sound reflecting surface panels resting against said enclosure, and

a blower mounted in a wall of said enclosure for blowing fluid out of the interior of said enclosure whereby a negative pressure is generated in said enclosure and said surface panels are pulled against the enclosure to form a seal against the escape of sound and vapor from said enclosure.

3,860,087
VIBRATOR SYSTEMS FOR GENERATING ELASTIC WAVES IN THE EARTH

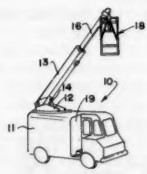
Daniel Silverman, 5969 S. Birmingham St., Tulsa, Okla. 74105
Continuation-in-part of Ser. No. 223,896, Feb. 7, 1972, Pat. No. 3,789,951. This application Oct. 11, 1972, Ser. No. 296,670
Int. Cl. G01v 1/00
U.S. Cl. 181—0.5 VM 17 Claims



1. A system for creating a train of seismic waves in the earth comprising:
   a. at least one expandable chamber comprising at least two parts reciprocable with respect to each other;
   b. a first part connected to a first frame in contact with the earth;
   c. a second part connected to a second frame;
   d. means to inject a train of pulses of pressurized fluid into said chamber;
   e. a mass resting on the earth's surface and having a portion over-hanging said second frame; and
   f. means alternately to place said mass in rigid, non-compliant compressive force-transmitting contact with said second framme, while said chamber is operating, and in tensile force-transmitting contact with said second frame while said chamber is not operating.

3,860,088
AERIAL LIFT PLATFORM LEVELING APPARATUS AND SYSTEM

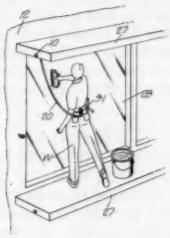
Robert K. Gellatly, Los Gatos, Calif., assignor to General Cable Corporation, San Carlos, Calif.
Filed Feb. 14, 1974, Ser. No. 442,641
Int. Cl. B66f 11/04
U.S. Cl. 182—2 20 Claims



1. In a system for maintaining a substantially horizontally level orientation of a platform which is pivotally connected about a first horizontal axis to the end of the boom of an aerial lift and in which the boom is adapted to be pivotally raised and lowered about a second horizontal axis, including the combination of pendulum means for seeking a constant vertical orientation under the influence of gravity, signal generator means coupled with said pendulum means for generating a control signal responsive to the pendulum means sensing operation of the aerial lift which causes said platform to move through an angle from said level orientation, actuator means for moving said platform about the first horizontal axis in a direction for returning the platform to said level orientation responsive to said control signal, and feedback means for terminating said control signal responsive to return of said platform to said level orientation.

3,860,089
SAFETY RAIL APPARATUS

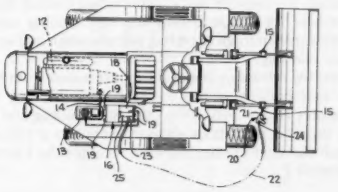
Richard W. Huggett, 316 Marlborough Rd., Rembrandt Pk., Johannesburg, South Africa
Filed Oct. 4, 1973, Ser. No. 403,663
Int. Cl. A62b 1/14; E04g 3/14
U.S. Cl. 182—4 5 Claims



1. In combination, a structure such as a building having concrete wall portions, an elongated non-metallic tube embedded in a concrete wall of the structure adjacent an outer face thereof to confine the tube against transverse expanding deformation, said tube having walls defining an internal cavity and having a continuous longitudinal entrance slot into said cavity and being of less transverse dimension than said cavity, a block member movable longitudinally in said cavity and of greater width than said slot to prevent escape of the block member through said entrance slot, the walls of said cavity converging toward said slot whereby forces on said block directed toward said slot tend to cause lateral expansion of said tube and a terminal fitting secured to said block member and extending slidably through said slot and having means for the releasable attachment thereto of movable means to be held adjacent said concrete wall, whereby tensioning of the terminal fitting by said movable means causes the block to exert the internal expanding force on the tube, resisted by the enclosing concrete wall.

3,860,090
MOBILE CONSTRUCTION MACHINE GREASING ASSEMBLY

Ellis R. Flanary, Richmond, Va., assignor to Flanary Industries, Inc., Richmond, Va.
Filed June 20, 1973, Ser. No. 371,863
Int. Cl. F16n 1/00, 7/14
U.S. Cl. 184—7 C 10 Claims



6. A greasing assembly for permanently mounting on a mobile construction machine having a source of compressed air and at least several grease fittings for use in periodically manually greasing said machine through said grease fittings, comprising:
   a generally rectangular box,
   a grease compartment in said box,
   a hose compartment in said box,
   a vertical wall separating said grease compartment from said hose compartment,

an aperture located in the lower portion of said separating wall,

an air driven grease pump including an air motor portion and an attached pump tube portion having a grease inlet end, said air motor portion being located in the bottom portion of said hose compartment and said pump tube portion extending horizontally through said aperture and into said grease compartment,

a flexible elongated grease supply hose having an outlet and an inlet connected to said air driven grease pump,

a grease control gun for coupling with grease fittings, and

a manually operated on-off valve located with said grease control gun for controlling the supply of grease connecting to the outlet end of said grease supply hose.

3,860,091

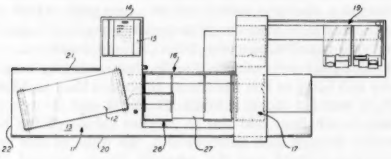
APPARATUS AND METHODS FOR MERCHANDISE TALLYING AND AUTOMATIC BAGGING

William R. Chesnut, 37 Laurel Pl., West Caldwell, N.J. 07006

Continuation of Ser. No. 339,780, March 12, 1973,. This application Dec. 3, 1973, Ser. No. 421,338

Int. Cl. B65b *67/04*

U.S. Cl. 186—1 A **21 Claims**



1. An automatic merchandise tally and bagging apparatus comprising:

a. a counter;

b. a cassette-loading station contiguous to the counter;

c. a rear support wall on the cassette-loading station inclined at an angle from the vertical;

d. conveyor means extending along the rear support wall;

e. a cassette in the cassette loading station, the cassette having a rear wall and a pair of opposed, spaced-apart side walls the cassette being open at the front and bottom and adapted to receive merchandise, the rear wall of the cassette being supported by said inclined support wall and the said conveyor means,

f. a reciprocating bag loading assembly at the end of the conveyor means opposite the bag loading station,

g. means for moving cassettes from the conveyor means into the bag loading assembly,

h. retractable support means on the bag loading assembly beneath the cassette as it enters the bag loading assembly,

i. means for reciprocating the bag loading apparatus downwardly into an open bag therebeneath and upwardly from said bag,

j. means for retracting the said support means from beneath the merchandise in the cassette when the bag loading assembly is proximal to the bottom of the bag and returning the said retractable support means to a position beneath the next ensuing cassette to enter the bag loading assembly.

3,860,092

PORTABLE HOISTING AND EVACUATION APPARATUS

William O. Holmes, 550 Battery, No. 504, San Francisco, Calif. 94111

Filed Apr. 19, 1973, Ser. No. 352,531

Int. Cl. A62b *1/02*

U.S. Cl. 187—6 **37 Claims**

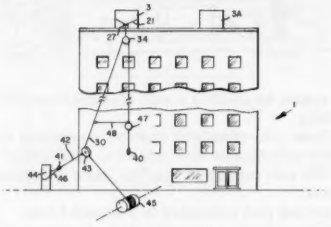
1. A portable hoisting system comprising:

an anchoring systemm adapted to be secured to a fixed portion above ground level of a fixed structure, said anchoring system including a first anchor line, a means for temporarily anchoring said first anchor line to said fixed portion, a first pulley, and a means for coupling said first pulley to said first anchor line, said means for coupling including first winch means for adjusting the position of said first pulley relative to said first anchor line;

a load line including means for coupling to a load;

a means for reeving said first pulley with said load line; and said winch means, load line and anchor line being tensioned to said fixed portion while said system is in use.

22. A method of rigging a portable hoisting system comprising the steps of:



temporarily securing a first flexible anchor line to a fixed portion above ground level of a fixed structure;

thereafter coupling a first pulley to said first anchor line;

fetching a relatively heavy load line from a distance to said anchored first pulley by connecting the load line to a relatively light line on a reel and reeling the light line and heavy line to the vicinity of the fixed structure;

reeving said first pulley with said load line after said load line is brought to said first pulley; and

adjusting the position of said first pulley relative to said first anchor line.

3,860,093

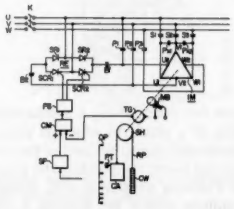
ELEVATOR DRIVING SYSTEM

Nobuo Mitsui, Katsuta; Tadao Kameyama, Higashi; Akinori Watanabe, Ibaraki; Isao Fukushima, and Takanobu Hatakeyama, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 29, 1973, Ser. No. 364,494

Int. Cl. H02k *7/48*

U.S. Cl. 187—29 R **18 Claims**



1. An elevator driving system comprising:

a three-phase induction motor including delta-connected armature windings and having apex terminals (U_1, V_1, W_1) of the delta-connection and intermediate terminals (U_2, V_2, W_2) of the respective phase windings;

means for connecting said apex terminals to one another and for simultaneously connecting said intermediate terminals to a three-phase a.c. power supply for driving the elevator at a high speed; and

means for disconnecting the mutual connection of said apex terminal and for simultaneously applying a d.c. voltage across two terminals arbitrarily selected from at least one of said apex terminals and said intermediate terminals for braking the elevator.

3,860,094
SELF-TIGHTENING BRAKE FOR BICYCLES, MOTORCYCLES AND THE LIKE

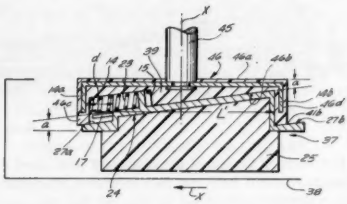
Roger Breton, Galerias D.M.S. Calle Poniente 9, Salou-Tarragone, Spain

Filed Dec. 17, 1973, Ser. No. 425,113

Claims priority, application France, Dec. 26, 1972, 72.47126

Int. Cl. B62l 1/12

U.S. Cl. 188—24 **10 Claims**



1. A brake for arresting a surface displaceable in a predetermined direction past said brake, said brake comprising:

a box casing having a generally planar back wall turned toward said surface, a pair of longitudinal parallel side walls extending from said back wall toward said surface and generally parallel to said direction, and a front end wall and a rear end wall each bridging said side walls and extending from said back wall, said end walls being parallel and spaced in said direction, said back wall being inclined into said direction at an acute angle from said rear end wall to said front end wall;

means for displacing said casing toward and away from said surface generally perpendicularly to said direction;

a brake shoe having a brake pad frictionally engageable with said surface and a holder carrying said pad and provided with a wedge wholly receivable between said side walls and between said end walls and having a generally planar face inclined to said direction and flatly engaging said back wall, said wedge having a longitudinal length in said direction less than the longitudinal length of said back wall in said direction between said end walls; means for securing said shoe longitudinally slidably in said casing, whereby on sliding of said shoe in said casing said pad moves generally perpendicularly to said direction; and

a compression spring enclosed in said casing and having one end bearing on said rear end wall and another end bearing on said wedge to urge same toward said front end wall.

3,860,095
VEHICLE BRAKES

Herbert Keith Morris, Kingsgrove, New South Wales, Australia, assignor to Girling Limited, Tyseley, Birmingham, England

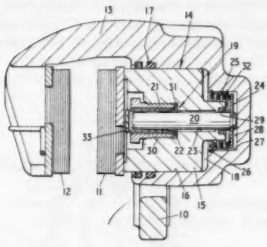
Filed Aug. 20, 1973, Ser. No. 389,524

Claims priority, application Great Britain, Sept. 1, 1972, 40533/72

Int. Cl. F16d 65/54

U.S. Cl. 188—71.8 **8 Claims**

1. In a hydraulic actuator for a spot-type disc brake having two components relatively movable apart by the application of hydraulic pressure therebetween: an anti-knock back device is operative between said two components of the actuator and comprising first and second relatively movable members, a spring biassing one of said members for movement with one of said actuator components, means sealingly guiding said one member in the other of said actuator components such that the hydraulic pressure between said components acts on said one member in opposition to said spring and the other of said members being effectively part of said other actuator component, said first member having a cylindrical surface, a split ring engaged with said cylindrical surface on said first member under the resilience of said split ring, an abutment on said second member cooperating with said split ring, cooperating



wedging surfaces on said split ring and said second member such that said split ring can move axially relatively to said second member by a distance equal to the desired brake slack, whereby engagement between said wedging surfaces, as when said actuator components are knocked towards one another or said hydraulic pressure exceeds a predetermined value at which said spring is overcome, prevents said split ring sliding back on said first member but the force required to push said split ring forward on said first member when there is no engagement between said wedging surfaces is lower than the force of said spring.

3,860,096
FRICTION BRAKING APPARATUS

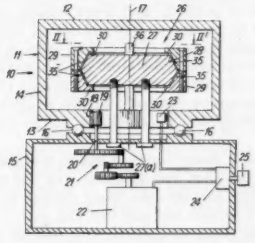
John Manners-Smith, Manchester; Christopher Garth Thompson, Nantwich, and Peter Tinning, Manchester, all of England, assignors to Ferranti Limited, Hollinwood, Lancashire, England

Filed Aug. 28, 1973, Ser. No. 392,277

Claims priority, application Great Britain, Aug. 30, 1972, 40166/72

Int. Cl. B60t 7/12

U.S. Cl. 188—134 **8 Claims**



1. Friction braking apparatus comprising two relatively rotatable members, a first of said members comprising a circular plate having a V-shaped peripheral wall, the second of said members comprising two or more component parts each having a V-shaped surface conforming to and co-operating with the peripheral wall for at least a portion of the circumference thereof, a layer of low friction high density plastics material sandwiched between each component part and the periph-

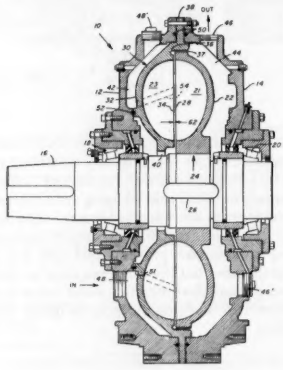
eral wall, bias means urging each component part towards the peripheral wall to produce a contact pressure therebetween, and drive means operable to rotate the second member with respect to the first member by first reducing the said contact pressure until static friction is overcome and then reapplying the contact pressure throughout continued rotation of the second member.

3,860,097

INDIVIDUALIZED STATOR AND ROTOR FOR HYDROMATIC BRAKES

Steve A. Braschler, and George A. Prather, both of Coffeyville, Kans., assignors to Parmac, Inc., Coffeyville, Kans.

Continuation-in-part of Ser. No. 57,907, July 24, 1970, abandoned. This application Aug. 3, 1972, Ser. No. 277,669
Int. Cl. F16d *57/04*
U.S. Cl. 188—296 **5 Claims**



1. A hydromatic brake system including:

housing means having a separate first end wall, intermediate cylindrical spacer, and separate second end wall;

shaft means rotatably supported in said housing means;

first and second rotor-stator sets comprising:

first and second brake rotor means each having a single annular liquid space with a plurality of webs defining a plurality of pockets, said webs leading in the direction of rotation, each having an outer peripheral surface,

first and second brake stator means each having a singular annular liquid space with a plurality of webs defining a plurality of pockets, said webs leading in a direction opposite to the direction of rotation of said rotor, a conduit passing through each of said webs in said stator to provide communication from a back surface thereof to each of said pockets, each stator having a circumferential seal lip means on said back surface, an outwardly extending circumferential planar flange, and an inner peripheral rim;

said first stator assembled such that its said flange is sealably retained between said first end wall and said spacer to form a first annular inlet space defined by said seal lip, said back surface and said first end wall,

said second stator assembled such that its said flange is sealably retained between said spacer and said second end wall to form a second annular inlet space defined by said seal lip, said back surface and said second end wall

said first and second rotor means spaceably attached to said shaft with the respective pockets facing their respective stator pockets to form an annular outlet space defined by said spacer and the space between said rotors, said outer peripheral surfaces of each rotor positioned opposite said inner peripheral rim of each respective stator with a selected small radial clearance therebetween to maintain a substantially fixed liquid back pressure in said pockets, and

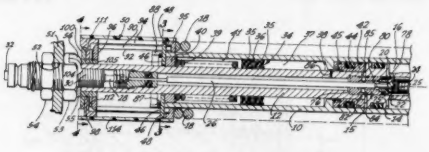
means to supply a continuous flow of hydraulic liquid to said annular inlet spaces, and means to remove said liquid from said annular outlet space.

3,860,098

HYDRAULIC LOCKING DEVICE

Percy L. Porter, and Clyde R. Porter, both of Los Angeles, Calif., assignors to P. L. Porter Co., Los Angeles, Calif.

Continuation-in-part of Ser. No. 846,782, Aug. 1, 1969, abandoned. This application Dec. 22, 1971, Ser. No. 211,074
Int. Cl. F16d *63/00*
U.S. Cl. 188—300 **4 Claims**



1. In a locking device of the character described to control relative movement between two members, comprising a hydraulic cylinder connected to one of the two members, a tubular piston rod extending through at least one end of said cylinder and connected to the other of the two members, a piston united with the piston rod, the piston dividing the interior of the cylinder into two locking chambers, and a locking valve controlling fluid flow between the two chambers to control the freedom of movement of the piston, the improvement comprising:

a reservoir for hydraulic fluid to replenish the fluid in the two chambers, a portion of said tubular piston rod forming a wall of the reservoir,

said reservoir having a movable wall;

means including a radial port in said portion of the tubular piston rod to permit flow of hydraulic fluid from the reservoir to one of said two locking chambers when the piston is at one of its two opposite limit positions,

spring means acting against said movable wall of the reservoir to place the fluid in the reservoir under pressure for effecting flow to one of said locking chambers; and

sealing means embracing the tubular piston rod adjacent one end of the reservoir,

said radial port being positioned along the length of the tubular piston rod to move out of communication with the reservoir into the region of said sealing means and past the sealing means when the piston moves out of one of its limit positions towards its other limit position whereby the reservoir is cut off from both of said locking chambers whenever the piston moves out of said limit position.

3,860,099

COMPOSITE CONTACTOR ROLL FOR ELECTROPLATING

Daniel A. Weiskopf, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed May 18, 1973, Ser. No. 361,680
Int. Cl. B60l *9/00*
U.S. Cl. 191—1 A **5 Claims**

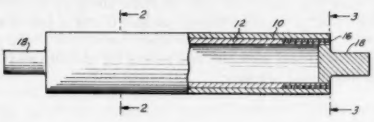
5. A composite roll for use in spparatus for continuously electroplating steel strip, comprising:

a. a cylindrical metal shell, said shell being characterized by high resistance to chemical attack by the electroplating bath and by medium electrical resistivity;

b. a metal sleeve within said shell, said sleeve being in contact with the middle portion of said shell and out of contact with the end portions thereof, said sleeve being

characterized by a resistivity substantially lower than that of said shell;

c. annular electrical insulating means disposed between the end portions of said shell and said sleeve, said means comprising an elastomer; and



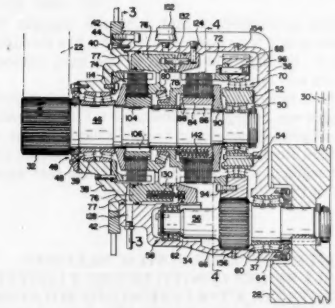
d. means, including a collector head secured to each end of said roll, providing a low resistance path from said sleeve to a source of current.

3,860,100

DRIVE UNIT FOR PRESSES

Edwin A. Spanke, Oak Forest; Louis F. Carrieri, La Grange Park, and Melvin H. Francey, Palos Heights, all of Ill., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Aug. 29, 1973, Ser. No. 392,667
Int. Cl. F16d *67/04*
U.S. Cl. 192—18 A **9 Claims**



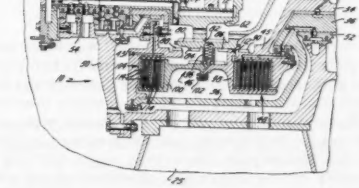
1. A press drive mechanism comprising a housing, an input shaft supported in said housing for rotation about a first axis, an output shaft supported in said housing for rotation about a second axis offset from and parallel to said first axis, clutch means for operatively connecting said input and output shafts, said clutch means including a clutch abutment plate on said output shaft and interposed first and second clutch disc means, said first clutch disc means being carried by said output shaft for rotation therewith, means separate from said input shaft supporting said second clutch disc means for rotation relative to said housing, means interconnecting said second clutch disc support means with said input shaft for said second clutch disc means to be rotated in response to rotation of said input shaft and at a rotational speed less than said input shaft, brake means for said output shaft, said brake means including a brake abutment plate on said output shaft and interposed first and second brake disc means, said first brake disc means being carried by said output shaft for rotation therewith and said second brake disc means being supported by said housing against rotation, said clutch disc means and said brake disc means being axially spaced apart relative to said output shaft to provide an axial space between the axially inner ones of said clutch and brake disc means, annular clutch presser plate and brake presser plate members in said axial space, an annular fluid actuated piston concentric with said output shaft and extending about said clutch and brake disc means, means including annular cylinder means in said housing supporting said piston for axial displacement relative to said output shaft and against rotation relative to said housing, means interconnecting said brake presser plate member with said piston for axial displacement therewith, said clutch presser plate member being mounted on said output shaft for rotation therewith and for axial displacement relative thereto, said brake and clutch presser plate members having radially spaced overlapping portions in said axial space, bearing means between and radially interengaging said overlapping portions, said piston moving said brake and clutch presser plate members in the axial direction to displace said clutch presser plate member toward said clutch abutment plate to actuate said clutch means in response to the introduction of fluid under pressure into said cylinder means, and means biasing said piston and said clutch and brake presser plate members to move in the direction to displace said brake presser plate member toward said brake abutment plate to actuate said brake means upon release of fluid pressure from said cylinder means.

3,860,101

SYNCHRONOUS CLUTCH ASSEMBLY FOR A TRANSMISSION DEVICE

Angelo De Feo, Totowa, and Edward F. Drewniany, Oradell, both of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Oct. 26, 1973, Ser. No. 409,919
Int. Cl. F16d *23/06*
U.S. Cl. 192—53 F **4 Claims**



1. In a rotation transmission device having dual concentric rotatively driven first and second input members connected to be alternately driven in opposite directions by a prime mover and having an output member, the combination of a synchronous clutch assembly for alternately connecting said first and second input members to said output member, said synchronous clutch assembly comprising:

a. first splines on said first input member;

second splines on said second input member spaced axially from said first splines;

c. a switch means comprising:

a-1. a double-acting piston-cylinder mechanism connected to rotate said output member and supported for reciprocative movement to two operative positions;

b-1. said mechanism having third splines disposed to alternately mesh in the two operative positions with said first and second splines on said first and second input members;

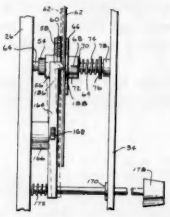
c-1. slip-clutch means for each of said first and second input members;

d-1. a shuttle means disposed and supported for rotative and linear movement adjacent said first and second input members and having two axially spaced fourth and fifth splines;

e-1. said mechanism being provided with sixth splines for alternately engaging said fourth and fifth splines of said shuttle means upon reciprocative movement of said mechanism;

f-1. said shuttle means being connected to said mechanism for conjoined rotation and linear movement relative to said mechanism to effect alternate engagement of said slip-clutch means of said first and second input members to thereby synchronize rotation of said output member and the input member to be connected thereto prior to said third splines meshing with the first or second splines associated with the input member to be connected.

3,860,102
CLUTCH ASSEMBLY FOR HYBRID ANALOG-TO-DIGITAL CONVERTER
John Henry Hosemann, Cheyenne, Wyo., assignor to Ideal Aerosmith, Inc., Cheyenne, Wyo.
Division of Ser. No. 190,137, Oct. 18, 1971, Pat. No. 3,754,239. This application Apr. 4, 1973, Ser. No. 347,820
Int. Cl. F16d *13/38*
U.S. Cl. 192—66 **4 Claims**



1. In an apparatus having a rotatable shaft with a disc and a friction plate thereon, one of said disc and friction plate being fixed to the shaft for unitary rotation therewith and the other of said disc and friction plate being rotatably disposed on the shaft, drive means for rotating said friction plate and resilient means for biasing said disc into pressured engagement with said friction plate, the improvement comprising a clutch assembly for effective relative movement of said disc and friction plate into and out of pressured engagement, the clutch assembly including a pivotal bar with one end disposed adjacent to said disc for movement into and out of pressured engagement with said disc to effect disengagement and engagement of said disc and friction plate, and cam means interposed between said rotatable shaft and pivotal bar responsive to rotation of said rotatable shaft whereby to cause pivotal movement of said pivotal bar against the bias of said resilient means out of engagement with said friction plate and alternately into engagement with said friction plate through the biasing of said resilient means.

3,860,103
SEGMENT SHIFT ARRANGEMENT
Theodore N. Madison, Rocky Hill, Conn., assignor to Litton Business Systems, Inc., New York, N.Y.
Filed Feb. 28, 1973, Ser. No. 336,775
Int. Cl. B41j *7/50*
U.S. Cl. 197—74 **3 Claims**

1. Case shift mechanism for a typewriter comprising a frame,

a plurality of type bars each of which has upper and lower case type characters thereon,

a type bar segment pivotally supporting said plurality of type bars,

a power roll,

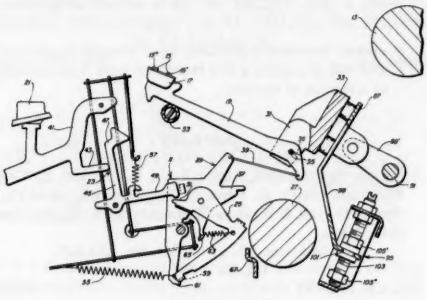
a plurality of sublevers pivotally mounted on said frame,

links connecting an associated sublever to an associated type bar,

each of said sublevers rotatably mounting a cam operative when engaged with said power roll to drive its associated sublever and connected type bar from a rest position,

means defining segment upper case and lower case limit positions,

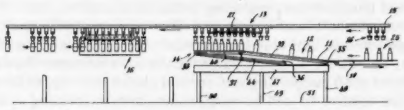
means for moving said segment from the case limit position toward the other case limit position along an arc including a shaft pivotally mounted on said frame, a pair of arms secured to said shaft and pivotally connected at the ends thereof to said segment, and means for rocking said shaft to move said segment,



said pivotal connection of said arms and segment being movable to said limit positions through a line through the center of said shaft and parallel to said links connecting sublevers and type bars, and

a plurality of type bar return springs connected to each of said sublevers acting collectively as the sole agency to urge said pivotal connection toward a limit position after it has been moved through said line incident to movement of said segment thereby to detentably hold said segment in one or the other case limit position.

3,860,104
BOTTLE CONVEYOR SYSTEM INCLUDING ADJUSTABLE HEIGHT CONTINUOUS BELT CONVEYOR AND POSITIVE LOCK SPRAY SHIELDED ROTATABLE BOTTLE CARRIER
Leopold Strauss, East Rockaway, N.Y., assignor to Indian Head Inc., New York, N.Y.
Filed Apr. 19, 1973, Ser. No. 352,682
Int. Cl. B65g *37/00*
U.S. Cl. 198—240 **6 Claims**



1. The combination of a. an adjustable height conveyor system comprising a continuous belt passing over and around a plurality of rollers rotating on parallel axes, a first and second of said rollers fixedly mounted in a first horizontal linkage, a third and fourth of said rollers mounted in a second adjustable horizontal linkage elevated above the plane of said first pair of rollers, first and second parallel inclined rigid linkages of equal length extending between said first and second horizontal linkages and pivotally mounted thereto, and adjustable jack means extending between a rigid base support and said second horizontal linkage whereby the elevation of said second horizontal plane may be varied without changing the length of said continuous belt; and b. an overhead carrier track extending longitudinally over and substantially parallel to said second horizontal linkage, a plurality of individual

neck-gripping container carriers mounted on said overhead track and linked together to form a continuous chain, cam follower means on each of said carriers engageable with cam means mounted on said overhead track in the vicinity of said second horizontal plane for opening the neck-gripping mechanism of said carriers as they pass thereover, a feed screw rotatably mounted on said second horizontal linkage for rotation about a horizontal axis extending parallel and adjacent to said conveyor belt, and synchronous drive means for said overhead carrier chain and said feed screw whereby containers traveling on said conveyor belt are uniformly spaced beneath and in vertical alignment with said individual overhead carriers upon traversing said second horizontal plane, and said elevated overhead carriers are successively engagingly closed into neck-gripping engagement with said containers as said cam follower means disengages said overhead cam means.

3,860,105

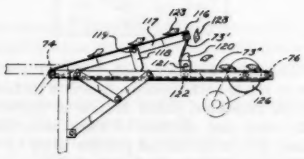
BREADING MACHINE CONVEYOR

Richard T. Johnson, Sandusky, Ohio, assignor to Sam Stein Associates, Inc., Sandusky, Ohio

Division of Ser. No. 192,170, Oct. 26, 1971, Pat. No. 3,762,363, which is a division of Ser. No. 2,239, Jan. 12, 1970, Pat. No. 3,647,189, which is a division of Ser. No. 740,701, June 2, 1968, Pat. No. 3,547,075. This application Apr. 9, 1973, Ser. No. 349,374

Int. Cl. B65g *21/02*

U.S. Cl. 198—122 **1 Claim**



1. In a machine for coating a food product with breading material, an open mesh endless wire belt for conveying coated product, a conveyor frame having parallel side rails, pulleys supported in said side rails at each end of said belt ends about which said belt travels including a drive shaft carrying said pulleys at the upstream end of said belt, said belt being longer than sufficient to stretch with upper and lower straight runs between said pulleys, means including a support bar extending at right angles to said belt and engaging said belt, a pair of support arms pivoted on said drive shaft at opposite sides of said belt, an adjustable prop member pivotally supported on each support arm and in position to engage its free end against the associated side rail for lifting a zone of said belt above said upper run, and means engaging a bight of said belt between said support bar and the level of said upper straight run and holding said excess length of belt under tension, whereby the height of said support bar for flipping over pieces of product may be varied without changing the length of said belt.

3,860,106

RECIPROCAL ACTUATING MEANS FOR ROTATING CONVEYOR ROLLERS

Robert H. Cooley, 1116 Macon Ave., Pittsburgh, Pa. 15221

Filed Mar. 20, 1973, Ser. No. 342,972

Int. Cl. B65g *13/06*

U.S. Cl. 198—127 R **8 Claims**

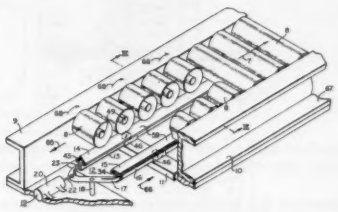
1. In a live-roller conveyor of the type wherein articles to be conveyed are carried by a multiplicity of load-supporting rollers which are continuously rotated, the combination comprising:

a. a plurality of load-carrying rollers;

b. means for continuously rotating said plurality of load-carrying rollers in one direction of rotation comprising:

1. a reciprocally-moving power device having reciprocal movement in two opposing directions one being a power-driving direction and the other a non-power-driving direction;

2. frictional means intermittently causing a frictional driving contacting engagement of said reciprocally-movable power device with said plurality of load-carrying rollers in said power-driving direction;



3. means effecting release of said frictional driving contacting engagement of the movable power device with the plurality of load-carrying rollers in said other non-power-driving direction of said moving power device; and,

4. said power device repeating its frictional driving power stroke of said plurality of rollers in said one power-driving direction, whereby continuously rotation of the plurality of load-carrying rollers in the same rotative direction is provided in said power-driving direction.

3,860,107

FEED FIXTURE FOR HANDLING MACHINES OF VIALS OR THE LIKE

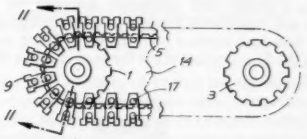
Elisabetta Cioni; Lucia Cioni, and Rovena Anichini Cioni, widow, all of Via di Marciano 22, Siena, Italy

Filed Jan. 24, 1974, Ser. No. 436,389

Claims priority, application Italy, Jan. 29, 1973, 9316/73

Int. Cl. B65g *17/12*

U.S. Cl. 198—131 **5 Claims**



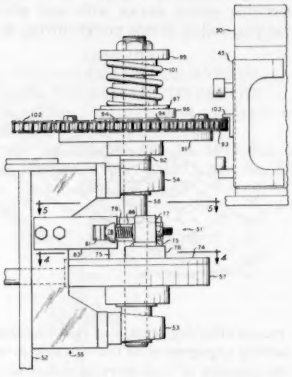
1. Endless conveyor fixture for vials, bottles or other containers, for the manufacture, the filling and the closure of the same containers, including: toothed disc rotary advance members, an endless, flexible and inextensible, annular belt element, with a smooth inner surface and projections and recesses on the outer surface; a plurality of members, similar to each other, each forming at least one seat or housing for container, each of said members including a surface provided with recesses and projections and adjacent said surface a seat for a clamping plug; a clamping plug or pin that can be inserted into the seat of said each member to cooperate with the endless inner surface of the flexible belt element, to force it with its own projections and recesses against said recesses and projections in the respective member, said plug or pin forming a tooth for the engagement by said feed toothed disc members.

3,860,108

DOUBLE RATCHET CONVEYOR DRIVE MECHANISM

Silvio T. Farfaglia, Fulton, N.Y., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 7, 1973, Ser. No. 395,032
Int. Cl. B65g *23/00*
U.S. Cl. 198—203 **15 Claims**



1. A ratchet drive mechanism comprising a drive shaft, a first ratchet mounted on said shaft and secured thereto for rotation therewith and having teeth extending in a first direction, a second ratchet mounted on said shaft and secured thereto for rotation therewith and having teeth extending in the direction opposite to said first direction, at least one ratchet drive pawl, support means for mounting said at least one ratchet drive pawl and adapted for rotation about the elongated axis of said shaft, means for resiliently urging said at least one ratchet drive pawl into engagement with the teeth of said ratchet during the forward rotation of said support means about the said elongated axis to rotate said first and second ratchets and said shaft during the forward rotation of said support means, reciprocating means for driving said support means forward and then backward in oscillatory rotative motion about said elongated axis, a pivotably mounted brake arm adapted to be rotated into contact with a tooth of said second ratchet during the forward rotation of said support means, a striker arm resiliently mounted on said support means and adapted to engage said brake arm and pivot said brake arm into contact with a tooth of said second ratchet during the final portion of the forward rotation of said support means.

3,860,109

CABLE-DRIVEN TRANSMISSION FOR FREE STALL BARN CLEANERS

Thomas G. Benzmiller, P.O. Box 207, Stevens Point, Wis. 54481

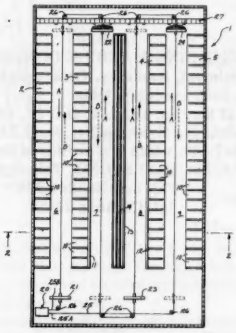
Filed May 10, 1973, Ser. No. 359,142
Int. Cl. B65g *25/08*
U.S. Cl. 198—224 **5 Claims**

1. A barn cleaner transmission for driving cleaning means in a reciprocating manner along a barn floor and including (a) a cable drive sheave, (b) a cable arranged about the cable drive sheave and having a first branch and a second branch extending therefrom for connection to the cleaning means, and (c) drive means to rotate the cable drive sheave in one direction in which the first branch of the cable is driven and under tension while the second branch is nondriven and slightly slack and also rotate the cable drive sheave in the opposite direction in which the second branch is driven and under tension while the first branch is non-driven and slightly slack, the cable drive sheave and the drive means being mounted on a frame,

the improvement therein comprising:

a pivotable tightener arm for each of the first and second branches of the cable, each tightener arm being pivotally mounted on the frame,

1. contact means carried by each tightener arm for contacting its respective branch of the cable,
2. each tightener arm being pivotable between
   (i) a first position in which its contact means is moved towards the cable drive sheave to engage its respective cable branch and wrap the branch about part of the cable drive sheave and (ii) a second position in which its contact means is moved away from the cable drive sheave;



means connected between each tightener arm and the frame to rotate each tightener arm into its first position when its respective cable branch is non-driven and slightly slack and adapted to allow movement of the tightener arm to its second position when its respective cable branch is driven and under tension;

a slide affixed to the floor of the barn, the frame being inserted in the slide and horizontally movable relative thereto; and

connecting means between the slide and the frame, the connecting means being adjustable to enable tightening of the cable and further being adapted to allow movement of the frame relative to the slide when an obstruction prevents movement of the cleaning means.

4. A barn cleaner transmission for driving cleaning means in a reciprocating manner along a barn floor and including (a) a cable drive sheave, (b) a cable arranged about the cable drive sheave and having a first branch and a second branch extending therefrom for connection to the cleaning means, and (c) drive means to rotate the cable drive sheave in one direction in which the first branch of the cable is driven and under tension while the second branch is non-driven and slightly slack and also rotate the cable drive sheave in the opposite direction in which the second branch is driven and under tension while the first branch is non-driven and slightly slack,

the improvement therein comprising:

a frame on which the cable drive sheave and the drive means are mounted,

a slide affixed to the floor of the barn, the frame being inserted in the slide and movable relative thereto,

connecting means between the slide and the frame, the connecting means being adjustable to enable tightening of the cable and further being adapted to allow movement of the frame relative to the slide when an obstruction prevents movement of the cleaning means, and

first switch means carried on the slide and second switch means carried on the frame, the first and second switch means being spaced from one another when the cleaning

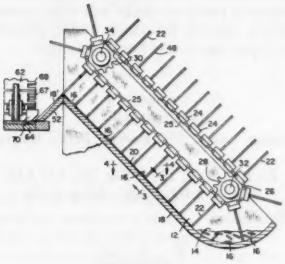
means is driven during operation of the transmission and being adapted to contact one another to disconnect power to the drive means when the cleaning means contacts an obstruction and the frame moves a selected distance relative to the slide.

3,860,110

PIN ORIENTING, ALIGNING AND TAPING MACHINE

Paul S. Newswanger, 1401 Vermont Ave., Lancaster, Pa. 17603

Filed Apr. 7, 1972, Ser. No. 223,323
Int. Cl. B65g *47/24*
U.S. Cl. 198—246 **5 Claims**



1. A pin orienting assembly adapted for use in a pin orienting and aligning apparatus wherein all of said pins are substantially identical and each pin has opposite longitudinal ends of a different configuration, the combination of

A. an orienting platform having a longitudinally extending channel for receiving said pins,
  1. said channel having a longitudinal axis,
  2. said platform having an upstream end and a downstream end,
  3. said platform being inclined inwardly from the upstream end to the downstream end;
B. storage means adjacent the upstream end of the orienting platform to hold a plurality of randomly oriented pins to be aligned; and
C. push rod means to push the pins into aligned orientation,
  1. said push rod means moving through the storage means to contact the pins,
  2. said push rod means traveling upwardly in registry over the channel,
  3. said push rod means terminating endwardly in a pin engaging section,
  4. a portion of said pin engaging section moving within the channel,
  5. said portion being laterally offset from the longitudinal axis.

3,860,111

PILL CONTAINER AND DISPENSER

Larry G. Thompson, 524 5th St., Traverse City, Mich. 49684

Filed June 11, 1973, Ser. No. 368,635
Int. Cl. B65d *83/04*
U.S. Cl. 206—534 **5 Claims**

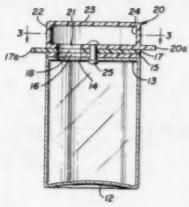
1. A pill container and dispenser comprising

a container having imperforate bottom and side walls and a top wall having a feed opening therethrough,

a disc disposed over said top wall and having a feed opening therethrough,

a cap member having a bottom wall with a feed opening therethrough and an imperforate, opaque top wall spaced from said bottom wall by a side wall thereby to define within said cap member a pill receiving chamber,

means connecting said cap member and said disc to said container for mutually independent rotation about a common axis,



said feed openings being equally spaced from said axis,

a pill dispensing opening in said side wall of said cap member, and

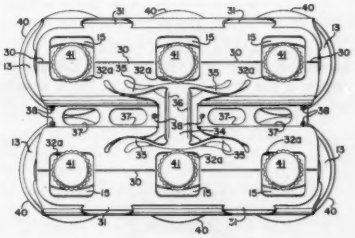
visible means on said cap member, said disc and said container for use in setting said feed openings in mutually aligned relationship.

3,860,112

BOTTLE CARRIER

Mindaugas Julius Klygis, Evergreen Park, Ill., assignor to Illinois Tool Works, Inc., Chicago, Ill.

Filed Aug. 6, 1973, Ser. No. 385,754
Int. Cl. B65d *75/00*
U.S. Cl. 206—151 **16 Claims**

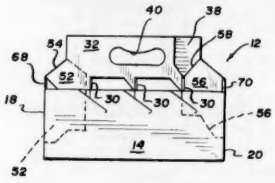


1. A carrier for a plurality of bottles having enlarged cap portions associated with their open ends comprising, said carrier being formed from resilient deformable plastic sheet material into two prism-like members having triangular end faces, said prism-like members being integrally interconnected in a parallel spaced-apart relationship with the bases thereof in a common plane, each of said bases having a plurality of first apertures positioned in a longitudinally spaced-apart relationship to accept and engage a portion of the neck of the bottles below their open ends, the apexes of said prism-like members having a plurality of second apertures therein, said second apertures having opposed side marginal edges formed as continuous straight line sections extending longitudinally of said prism-like members and spaced-apart a distance substantially less than the diameter of said enlarged cap portions of said bottles, each of said second apertures being in axial alignment with one of said first apertures, and handle means comprising a handle integrally interconnected between the ends of a pair of arms, said pair of arms being integrally interconnected between the inner side walls of said prism-like members to position said handle between and above said prism-like members.

3,860,113
CARRIER HAVING REINFORCED HANDLE MEMBER

Charles Robert Helms, Barto, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed June 26, 1972, Ser. No. 266,246
Int. Cl. B65d *75/00*
U.S. Cl. 206—185 4 Claims

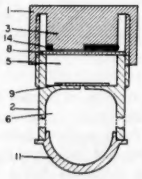


1. In a carrier carton formed from a unitary blank of foldable paperboard for packaging a plurality of similar articles, said carrier having opposed pairs of interconnected end walls and side walls and a bottom wall, the improvement comprising:
   a. at least one handle forming panel connected to the top portion of each of said side walls by at least one article separating strap;
   b. a load transmitting flap foldably joined to an end of said handle forming panel along a diagonal score line;
   c. said flap having a tab integrally formed therewith and connected to said end wall along a score line forming a continuation of said diagonal score line;
   d. said tab being folded inwardly along said score line and secured in a face-to-face relationship with the inner surface of said end wall to present a load carrying member transmitting the load from said handle to said end wall.

3,860,114
MULTI-CHAMBER CONTAINER

Volker Merckardt, Weg 10, 3550 Marburg, Germany

Continuation of Ser. No. 86,675, Nov. 4, 1970, abandoned. This application June 18, 1973, Ser. No. 371,134
Int. Cl. B65d *25/08*, *81/32*
U.S. Cl. 206—219 17 Claims

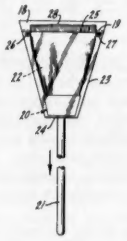


1. A multi-chamber container separately accommodating two or more substances which react with each other and are to be mixed when required to provide a ready-to-use dental material, the container comprising in combination:
   a first cylindrical container body defining a closed bottom end and having a primary mixing chamber containing a first substance;
   a second body portion of generally cylindrical configuration secured in coaxial relation to said first body and having a second chamber containing a second substance;
   a rupturable first diaphragm extending transversely across one of said bodies at a location axially forward of said closed bottom end separating said chambers and preventing any transfer of said substances therebetween until said diaphragm is intentionally ruptured;
   diaphragm means extending across said second chamber axially spaced from said first diaphragm in a forward direction closing the upper axial end of said second chamber;
   and a removable closure member in closing engagement with one of said bodies at the upper axial end thereof and including a piston projecting axially towards said diaphragm means externally to said second chamber, the bottom end face of said piston being substantially solid and having a diameter approximating the inside diameter of said second body;
   complementary co-engaging threaded means on said closure member and on one of said bodies;
   said piston having an axial length so that in the threaded co-engagement position prior to mixing of said substances said bottom face of said piston is axially spaced from said second body and subsequent to additional downwaard screwing said piston projects into said second chamber placing the second substance under pressure thereby causing rupturing of said first diaphragm.

3,860,115
BROOM SLEEVE

Louis Lawrence Laske, 556 Barron Blvd., Grays Lake, Ill. 60030

Filed Mar. 8, 1973, Ser. No. 339,116
Int. Cl. A46b *17/04*; B31b *49/04*
U.S. Cl. 206—361 4 Claims



1. A protective sleeve for a broom, having bristles attached at one end of a handle, said sleeve enveloping the bristles and locking in place when pulled over the bristles comprising:
   a tapered flexible sheet sleeve having opposite first and second open ends, said first open end being narrower than the free end of said bristles and said second open end being wider than the free end of said bristles and a constriction in said sleeve near said second open end constricting said sleeve to a width less than the width of the free end of the bristles and allowing the bristles to pass therethrough when compressed and thereafter expand to normal width thereby locking the sleeve in place over the bristles said sleeve comprising a pair of substantially trapezoidal sheets of a thermoplastic material joined together along opposed non-parallel edges thereof.

3,860,116
PACKAGING DEVICE

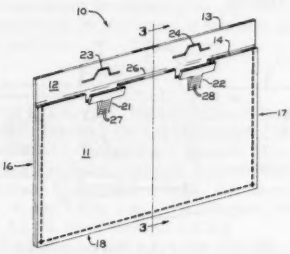
William A. Castine, Jr., Jeannette, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 30, 1973, Ser. No. 356,257
Int. Cl. B65d *85/48*
U.S. Cl. 206—454 17 Claims

1. A packaging device for a fragile plate-like article which comprises:
   a first generally rectangular panel having at least one foldable T-shaped tab member formed therefrom and attached thereto;

a second generally rectangular panel having a foldable upper portion;

means for fastening said first and second panels along their side and bottom marginal edges to continually urge a first surface of said first and second panels toward each other such that the space between the respective panels defines an envelope-like receptacle, and such that said upper portion of said second panel extends above the top edge of said first panel;



said upper portion including slot means for receiving said T-shaped tab members when said T-shaped tab members are folded in the direction away from said receptacle and when said upper portion is folded over the top edge of said first panel and downwardly between the T-shaped tab members and surface of said first panel opposite to the first surface thereof.

3,860,117

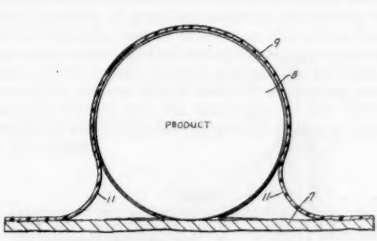
METHOD OF SKIN PACKAGING AND PACKAGE RESULTING THEREFROM

Richard L. Walus, Columbia Heights, and Gary E. Olson, Brooklyn Center, both of Minn., assignors to Possis Corporation, Minneapolis, Minn.

Filed Oct. 23, 1973, Ser. No. 409,007

Int. Cl. B65d *75/42, 75/46, 83/04*

U.S. Cl. 206—461 **17 Claims**



1. In the method of skin packaging of articles wherein a thin substantially clear thermoplastic film laid onto an air pervious substrate bearing the article to be packaged is drawn tautly about the article and onto the surface of the substrate surrounding the article to thereby secure the article to the substrate, by evacuating the space between the film and the substrate through the air pervious substrate, the improvement which assures a uniform unmottled appearance for the packaged article, and which improvement is achieved by spacing the thermoplastic film from the surface of the article by interposing therebetween a thin blanket of finely powdered material that is not incompatible with the thermoplastic film and has good lubricity and the capability of being reduced to very fine grain size.

3,860,118

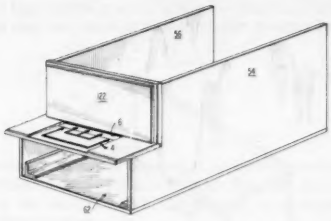
DOCUMENT TRANSPORTER

Frazier N. James, Sr., Alexandra, and Thomas E. Walker, Haymarket, both of Va., assignors to Ronald L. Walutes and Bernard S. Cohen, Co-Trustees in Bankruptcy of Frazier N. James, Sr., by said Walker

Filed July 21, 1972, Ser. No. 271,941

Int. Cl. B07c

U.S. Cl. 209—73 **5 Claims**



1. A document transport mechanism for a document verification and banking machine, a chassis having thereon a document receiving station, a document inspection station, and a document release station disposed at spaced locations along an endless conveyor run, and an endless conveyor mechanism for moving a document along said run from the first mentioned of said stations to the second mentioned, and from the second mentioned to the third, said endless conveyor mechanism comprising

a spaced pair of endless flexible conveyor elements,

means for supporting said endless flexible conveyor elements for movement along a substantially straight line for at least that portion of said run upon which the inspection stations is disposed,

a gripper spanning the space between said elements and having opposite ends respectively connected thereto, said gripper having jaws for engaging over an edge portions of a document,

means for driving said endless flexible conveyor elements step-by-step throughout an operating cycle so as to advance said document successively along a path from said receiving station to said inspection station and thence to said release station, said driving means providing a dwell of said document at said inspection station, means for opening said jaws at said release station,

said flat planar means disposed at said inspection station for engaging the surface of said document flatwise for performing an inspection function thereon.

3,860,119

HANGING FILE SUPPORT STRUCTURE

David Irvine, Lookout Heights, Ky.; Earl Barlow; John K. Carnes, both of Cincinnati, Ohio, and William F. Schmidt, Dry Ridge, Ky., assignors to Lit-Ning Products Co., Florence, Ky.

Continuation-in-part of Ser. No. 284,227, Aug. 28, 1972, abandoned. This application Jan. 2, 1973, Ser. No. 320,582

Int. Cl. B42f *17/08*

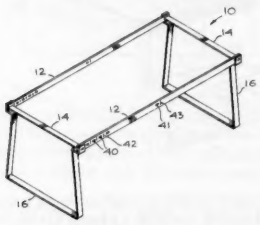
U.S. Cl. 211—45 **8 Claims**

1. A file support structure comprising at least one pair of side members, at least one pair of cross members, and at least one pair of support members, said at least one pair of side members having apertures therein, each member in said at least one pair of support members having at least two apertures therein, one positioned toward each extremity of said each support member, each member in said at least one pair of support members having a shape whereby said at least two apertures are generally aligned in opposition to each other, said at least one pair of cross members each having a tongue

portion configured to engage the apertures by insertion therein;

each support member being generally U-shaped with a flattened bottom section to provide added rigidity to the structure and including a Z-shaped portion adjacent each extremity of the support member with the aperture being located in the outermost end of the Z-shaped portion and with the middle part of the Z-shaped portion being adapted to support the side member vertically upon assembly therewith.

5. A file support structure comprising at least one pair of side members, at least one pair of cross members, and at least one pair of support members, said at least one pair of side



members having apertures therein, each member in said at least one pair of support members having at least two apertures therein, one positioned toward each extremity of said each support member, each member in said at least one pair of support members having a shape whereby said at least two apertures are generally aligned in opposition to each other, said at least one pair of cross members each having a tongue portion configured to engage the apertures by insertion therein;

each of said side members having along an edge thereof at least one recessed notch bounded by teeth spaced apart by a distance substantially equal to the dimension of each of said support members in the direction aligned with a side member.

3,860,120

FILING APPARATUS

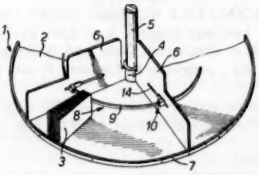
Harold Victor, Mitchell, Lawford, England, assignor to Elite Manufacturing Company Limited, Manningtree, Essex, England

Filed Dec. 26, 1973, Ser. No. 427,536

Claims priority, application Great Britain, Apr. 9, 1973, 16978/73

Int. Cl. A47f *7/00, 5/00*

U.S. Cl. 211—58 **8 Claims**



1. Filing apparatus comprising;

a support member defining a horizontal support surface for articles to be stored and a central vertical axis;

means for mounting said support member for angular movement about said central vertical axis;

flexible stop means for providing a variable curved surface against which an inner edge of an article supported on said support surface will abut; and

adjustable means for varying the position of said stop means radially of said axis and for varying the cruvature of the curved surface of said stop means.

3,860,121

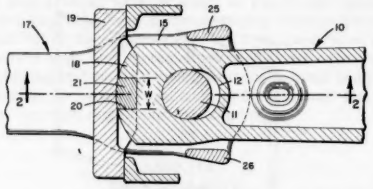
RAILWAY COUPLER SHANK

Ford F. Snell, Columbus, Ohio, assignor to Buckeye Steel Castings, Columbus, Ohio

Filed Dec. 27, 1972, Ser. No. 318,763

Int. Cl. B61g *9/04*

U.S. Cl. 213—62 **6 Claims**



1. In a railway coupler assembly comprising a shank having a butt pivotally connected to a draft yoke having upper and lower straps, a front follower disposed between said straps and having a face with a concave surface, said butt having a spherical surface in complementary engagement with said concave surface, the improvement which comprises a groove in said spherical surface and a bearing block secured in said groove, said bearing block having a surface of wear resistant metal which forms a segment of the said spherical surface of the butt and which is that portion thereof in complementary engagement with the concave surface of the follower.

3,860,122

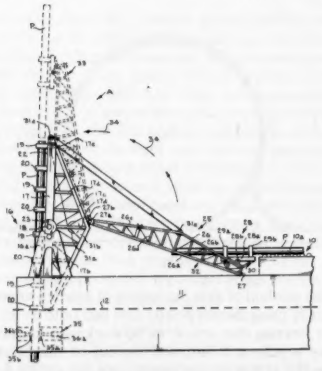
POSITIONING APPARATUS

Louis C. Cernosek, 214 Winkler Dr., Houston, Tex. 77027

Filed Dec. 7, 1972, Ser. No. 313,113

Int. Cl. B63B *35/04*

U.S. Cl. 214—1 P **13 Claims**



1. Apparatus for positioning piles and laying pipe by transferring a tubular member such as pipe from a platform or other support area to a submerged position at least partly underwater, comprising:

a platform;

a pipe positioner means including support frame means mounted on said platform and track means mounted with said support frame means for receiving and positioning pipe for movement to said submerged position;

load means mounted on said platform for loading pipe onto said pipe positioner means;

said load means being pivotally movable between a pipe pick-up position in which pipe is picked-up and a transfer position in which pipe is transferred onto said pipe positioner means;

said load means including pipe receiving and alignment means for receiving pipe with said load means in said pick-up position and pivoting pipe with respect to said load means to align the pipe with said pipe positioner means for loading said pipe onto said pipe positioner means with said load means in said transfer position; and pipe release means for releasing the pipe from said pipe positioner means for movement of said pipe to said submerged position.

3,860,123

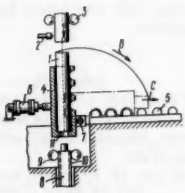
DEVICE FOR RECEIVING METAL INGOTS BEING CUT OFF IN THE COURSE OF CONTINUOUS CASTING

Nikolai Vladimirovich Molochnikov, prospekt Mira, 103, kv. 227; Vladimir Sergeevich Patrikeev, Belomorskaya ulitsa, 8, kv. 58; Abram Khaimovich Charny, Izmailovsky bulvar, 46/30, kv. 6, and Viktor Alexeevich Schepkin, Novogireevskaya, 49, kv. 54, all of Moscow, U.S.S.R.

Filed May 11, 1973, Ser. No. 360,375

Int. Cl. B65g 7/00

U.S. Cl. 214—1 QG **1 Claim**



1. A device for receiving metal ingots cut off in the course of continuous casting comprising: a crate adapted to receive the cut-off ingot and fitted in its bottom part with a hole sufficient for the passage of a dummy bar interacting with said ingot; a plurality of gears adapted for turning said crate about a horizontal pivot perpendicular to the longitunal axis of said crate; a plurality of gears for traversing said dummy bar in a vertical direction; and an attachment adapted to hold said ingot in said crate after said dummy bar has emerged from said crate, said attachment comprising projections provided on the internal side surfaces of said crate and overlapping partly the hole in its bottom part, the lateral face of said dummy bar being fitted with longitudinal grooves wherein said projections are introduced.

3,860,124

DEVICE FOR THE PRECISE POSITIONING, ON A MOBILE MOUNTING, OF AN OBJECT HOLDER INTRODUCED THROUGH AN AIRLOCK INTO A VACUUM-TIGHT ENCLOSURE

Jean Bouygues, and Rene Gerard, both of Paris, France, assignors to Thomson-CSF, Paris, France

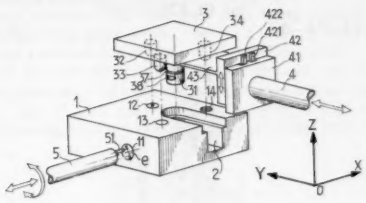
Filed Oct. 11, 1973, Ser. No. 405,567

Claims priority, application France, Oct. 13, 1972, 72.36420

Int. Cl. B65g 1/16

U.S. Cl. 214—1 CM **5 Claims**

1. A device for the precise positioning on a mobile mounting of an object holder introduced through an airlock into a sealed enclosure manipulated by means located outside said enclosure, utilizing movements of rotation about fixed axes, and of translation along said axes, said device comprising a first system, for displacement along a first axis (OY), means associated with said first system for displacing said object holder parallel to a second axis (OZ), and a second system, comprising means for locking said object holder to said mobile



mounting, and means capable of application and subsequent withdrawal by a displacement in accordance with a third axis (OX), the axes OX, OY, OZ forming a rectangular three-coordinate system.

3,860,125

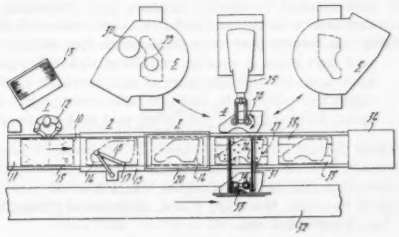
TRIM SEPARATION

Roger E. Johnson, Westland, and Joe Y. Sawai, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed June 8, 1973, Ser. No. 368,399

Int. Cl. B66c 1/02

U.S. Cl. 214—1 BH **6 Claims**



1. In an apparatus having a continuous porous flexible membrane with one side for supporting and conveying glass brackets to a handling and separating station, each of said brackets having been previously cut and severed to define a template and trim, the improvement comprising:

(a) means selectively acting against a side of said belt opposite from which said template and trim are supported, said means being effective to deform said belt upwardly in locations immediately beneath the template for thereby promoting a raised position of the template out of the plane of the trim;

(b) means in said raised plane for sensing the presence of inadvertantly attached trim to said template at least at three locations about said template periphery, said sensing means being programmed to automatically shift said template to a predetermined position in said plane for accurate pick-up, and

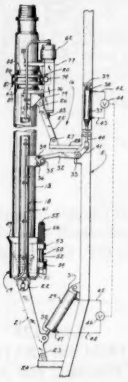
(c) mechanical means for picking up said raised template and for movably holding said template in a predetermined position for subsequent edge treatment.

3,860,126

PIPE HANDLING APPARATUS

Jack D. Neimark, New Berlin, and Matthew Smith, Milwaukee, both of Wis., assignors to Bucyrus-Erie Company, South Milwaukee, Wis.

Filed Oct. 10, 1973, Ser. No. 404,924
Int. Cl. E21b *19/00*
U.S. Cl. 214—2.5 **6 Claims**



1. A drill pipe rack for holding a drill pipe in an earth drilling machine comprising the combination of

a strut member;

a socket mounted on said strut member to receive one end of said drill pipe;

a retainer mounted on said strut spaced from said socket to restrain another end of said drill pipe in said pipe rack, said retainer having two arcuate jaws articulated on a common pivot to open and close about said drill pipe;

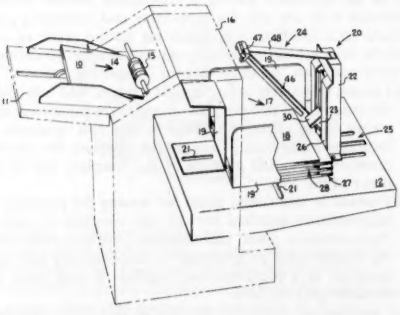
and said arcuate jaws having outer ends that diverge when said jaws open to receive or release said drill pipe and inner ends on opposite sides of said pivot pin from said respective outer ends, and said inner ends project into a space defined by said jaws when said jaws are open.

3,860,127

OFFSET STACKING MECHANISM

Arnold Fassman, Westport, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Oct. 15, 1973, Ser. No. 406,198
Int. Cl. B65g *57/00*
U.S. Cl. 214—6 N **8 Claims**



1. An offset stacking mechanism, comprising:

means for supporting a stack of material having a top surface thereon and comprised of two groups of bundles of sheets which are alternately offset from each other, said supporting means including an abutting surface member;

means for delivering a quantity of said bundles one bundle at a time to said stack supporting means;

stop means movably disposed with respect to said supporting means for stopping every other delivered bundle of sheets at a given position upon said supporting means relative to said abutting surface member, said stop means being movable between a first bundle contacting position and a second non-contacting bundle position in an alternating fashion such that bundles which are not stopped by said stop means are stopped by said abutting surface member, wherein every bundle which is delivered to said supporting means is uniformly stacked and respectively offset from a previously delivered bundle and also from a successively delivered bundle in said stack thus forming two groups of stacked, alternately offset bundles of sheets, said stop means being caused to pivotally move into contact with said top surface of said stack and then slidably adjust its height to a higher position relative to said supporting means when moved to the first bundle contacting position, such that a progressively higher position is achieved with every subsequent movement to said first bundle contacting position, which said height adjustment is for the purpose of accommodating the stop means to the progressively increasing height of said stack; and

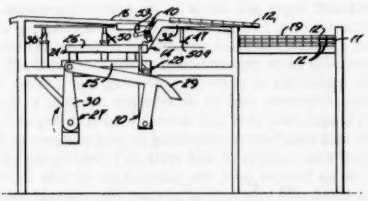
means operatively connected to said stop means for alternately moving said stop means between said first and second positions.

3,860,128

STICKER PLACING APPARATUS FOR LUMBER STACKING MACHINES

Sidney L. Lunden, Spokane, Wash., assignor to Moore-IEM, Inc., Spokane, Wash.

Filed Jan. 18, 1974, Ser. No. 434,368
Int. Cl. B65g *57/26*
U.S. Cl. 214—6 M **3 Claims**



1. In a lumber stacking apparatus having a supporting framework for receiving layers of boards at a layer loading station and a layer handling means mounted to the framework for vertical and horizontal movement thereon for lifting successive layers of boards from the loading station, moving the layers forwardly to a stacking station, lowering the layers onto a stack of boards at the stacking station, and subsequently moving rearwardly, stripping the layers onto the stack, an improvement comprising:

a sticker placing apparatus for placing stickers transversely between layers of boards to separate layers of boards within the stack, comprising:

sticker supports mounted to the supporting framework for supporting stickers at prescribed sticker pickup station below the layer loading station;

sticker engaging members mounted to the layer handling means for engaging and moving the stickers against the underside of the layers and along a path from the pickup stations to the stack in response to movement of the layer

handling means between the loading station and stacking station;

sticker stripping members located on the framework adjacent the stacking station and in the path of the stickers for stripping the stickers onto the stack as the layer handling means is moved rearward to strip the layers of boards onto the stack;

wherein the sticker engaging members are movable relative to the layer handling means between an extended position wherein the sticker engaging members extend into said path and a retracted position wherein the sticker engaging members clear the sticker stripping members as the layer handling means is retracted; and

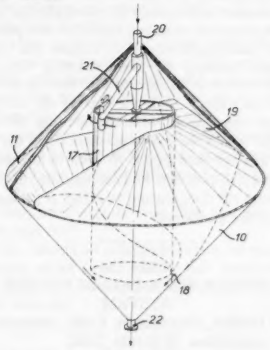
actuating means operatively connected between the sticker engaging members and the frame for automatically moving the sticker engaging members between the extended and retracted positions in response to movement of the layer handling means.

3,860,129

APPARATUS FOR HOMOGENIZING PARTICULATE MATERIAL

Andre Jean Bieth; Henri Jean-Marie Jeru, both of Le Trait, and Bernard Roger Pierre Bakker, Yvetot, all of France, assignors to Chantiers Navals de la Ciotat Etablissement du Trait, Seine Maritime, France

Filed June 23, 1972, Ser. No. 265,603
Int. Cl. B65g *65/32*
U.S. Cl. 214—16 R **15 Claims**



1. Apparatus for homogenizing particulate material comprising:

a container having a top and bottom,

feed means to feed material to the container through the top thereof in a series of juxtaposed layers corresponding to the natural angle of repose of said layers, which naturally reposed layers extend throughout said container to the bottom thereof, and

discharge means comprising outlet means which communicates with each of said layers at the bottom of said container when said container is filled to capacity, such that a small fraction of each layer is continuously and simultaneously withdrawn from the container, the surfaces of separation between successively extracted fractions of each layer being disposed transversely of surfaces of separation between the said juxtaposed layers.

3,860,130

STORAGE AND RETRIEVAL SYSTEM

John W. Frangos, 2 Brembal Hill Dr., Beverly, Mass. 01915

Filed Mar. 29, 1973, Ser. No. 345,868
Int. Cl. E04h *6/06*
U.S. Cl. 214—16.1 B **2 Claims**

1. A storage system comprising

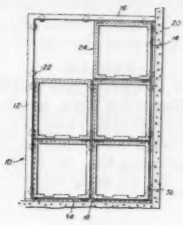
a. a structure defining a rectangular volume,

b. a plurality of matching individual rectangular storage units stacked in multiple columns within said volume,

c. power-driven transfer means mounted to said structure and engageable with said units for raising, lowering and shifting said units within said volume,

d. said structure and said units each being formed with cooperating guide means whereby a stack of units adjacent a vertical side of said structure will be guided on one side by said structure and on the opposite side by an adjacent stack of units and stacked units by each other,

e. each of said transfer means including a lead screw extending parallel to the path of travel of said units, a nut



threaded to said screw and relatively movable thereto and a latch mounted to one of said nut and screw for engagement with said units,

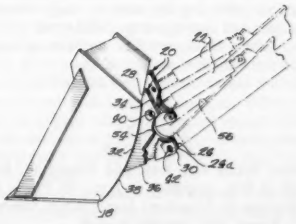
f. one of said lead screws being mounted horizontally along the base of said structure for shifting the lowermost unit in a stack from one side to the other and an articulated telescopic arm mounted for pivotal movement at one end to a movable follower nut driven by said screw and at the opposite end being mounted for pivotal movement to a point substantially in the vertical plane of a side of said structure at a height generally corresponding to the height of one of said units whereby said arm will restrain stacked upper units while the lowermost unit is displaced to an adjacent stack.

3,860,131

BUCKET MOUNTING HINGE

Norbert P. Borowski, Bellwood; Donald C. Marek, Hickory Hills; Bruno J. Panek, Palos Heights, and Walter F. Klaviter, Hickory Hills, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed June 14, 1972, Ser. No. 262,876
Int. Cl. E02f *3/28*
U.S. Cl. 214—145 **1 Claim**



1. A self-cleaning means for securing a hydraulically actuated material handling bucket means to a support boom means comprising:

a series of spaced apart hinge support means existing in pairs each defining a generally triangular formed plate means;

said triangular plate means having first, second, and third edge means and first, second, and third corner means;

said first edge means being fixed to said bucket means and said third edge means being cutaway;

said second corner means being pivotally secured to said boom means hydraulic piston means having one end pivotally connected to said boom means, the other end being pivotally secured to said third edge means, said cutaway portion of said third edge means being located between the attachment points of said boom means and said hydraulic piston means; said hydraulic piston means, said pair of hinge support means pivot in relation to said boom means in a scissor-like manner, one of said hinge support means passing on either side thereof whereby said cutaway third edge means allows the passage of mud therefrom over the entire work cycle.

3,860,132

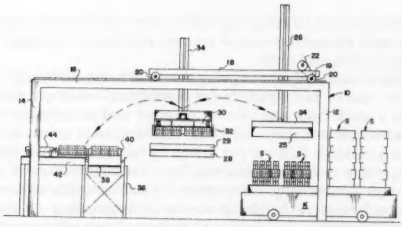
BRICK REGROUPING METHOD

Gerald L. Stuart, Homewood Acres, and Forrest A. Paschal, 418 W. Dolphin St., both of Siler City, N.C. 27344

Division of Ser. No. 276,031, July 28, 1972, Pat. No. 3,776,398. This application Nov. 28, 1973, Ser. No. 419,888

Int. Cl. B65g *59/02*

U.S. Cl. 214—152 **2 Claims**



1. Method of transferring brick from a kiln car, on which the bricks are arranged in a plurality of stacks, each having double-layer courses with a first prescribed number of bricks in each row and column, the bricks in each row having spaces therebetween, to a conveyor on which the bricks are arranged in courses having a second different prescribed number of bricks in each row and wherein the bricks in each row are compacted together comprising the steps of:

a. transferring the uppermost course from several of said stacks by simultaneously gripping said rows at the ends thereof, moving the bricks in said rows together, lifting and moving said courses to an intermediate table;

b. gripping the bricks in said courses deposited on said intermediate table on the ends of said columns, lifting said courses and moving some bricks row-wise with respect to others to change the row-wise spacing of the bricks in said courses; and

c. transferring said courses to said conveyor.

3,860,133

SAFETY CAP

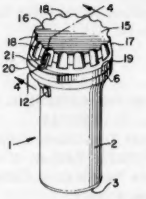
Leo M. Boxer, White Fish Bay, and Robert W. Boxer, Fox Point, both of Wis., assignors to James D. Pauls; Robert R. Burton; Warren M. Menaker; James Smith; Owen J. Ooms and Eli C. Frank, part interest to each

Filed Jan. 26, 1973, Ser. No. 327,220

Int. Cl. B65d *55/02, 85/56;* **A61j** *1/00*

U.S. Cl. 215—206 **11 Claims**

1. A safety cap and container combination, comprising a container having a closed bottom, a side wall, and an open upper end, a radially outwardly extending circumferential locking rib on the side wall adjacent the open upper end thereof, said rib having a substantially planar bottom surface and an inwardly tapered upper surface and having at least one notch therethrough; said cap comprising a top portion having a depending peripherally continuous skirt with an inner surface and an open bottom end, at least two circumferentially extending radially inwardly projecting camming lugs on the inner surface of the skirt at the open bottom thereof and closely circumferentially spaced apart in one half circular portion of the skirt, said camming lugs having substantially planar lower surfaces substantially in the plane of the open bottom end of the skirt and outwardly tapered upper surfaces and said lugs having a radial thickness substantially equal to the skirt wall thickness, and at least one circumferentially extending radially inwardly projecting locking lug on the inner surface of the skirt at the open bottom end thereof in the other



half circular portion of the skirt and opposite the camming lugs and substantially coplanar therewith, said locking lug having a circumferential extent substantially the same as said notch and registerable with the notch in one position of the cap so as to pass therethrough to release the cap from the container, said locking lug and camming lugs cooperably engaged with the lower surface of said locking rib in all other positions of the cap to lock the cap to the container, said camming lugs engageable with the locking rib to define a fulcrum about which the cap is pivoted when the locking lug is removed through said notch to remove the cap from the container, and said plurality of camming lugs and the locking lug and locking rib cooperating to effect a vacuum-tight seal of the cap on the container.

3,860,134

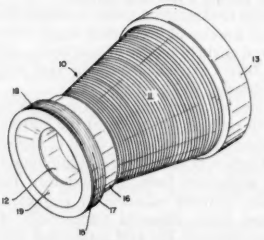
FLEXIBLE NOZZLE FOR A THRUST VECTOR CONTROL SYSTEM

Gerald F. Kobalter, Sacramento, Calif., assignor to Aerojet General Corporation, El Monte, Calif.

Filed July 26, 1972, Ser. No. 275,379

Int. Cl. B64c *15/06*

U.S. Cl. 239—265.43 **25 Claims**



1. In a thrust vector control system for a rocket motor or the like, a nozzle comprised of:

a main generally conically shaped body portion terminating at one end in an entrance portion and terminating at the other end in an exit portion;

substantially the entire main body portion of said nozzle consisting essentially of helically wound alternating layers

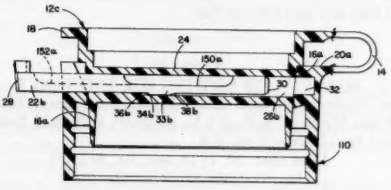
of a resilient material and a reinforcement material bonded together in a fluid tight and self-supporting manner; and

the exit and entrance portions of said nozzle being comprised of a rigid material.

3,860,135
CONTAINER AND CONTAINER-CAP COMBINATION

Michael A. Young, 4461 Cotton Ct., No. 4, Stockton, Calif. 95207, and Bob Mar, 850 N. Baker St., Stockton, Calif. 95203

Continuation-in-part of Ser. No. 390,546, Aug. 22, 1973,. This application Jan. 23, 1974, Ser. No. 435,675
Int. Cl. B65d *55/02, 85/56;* **A61j** *1/00*
U.S. Cl. 215—213 **27 Claims**



1. In combination:

a container having an opening with a lip for filling and emptying said container;

a stopper, sized to fit into and substantially conform to said opening and said lip, including at least one slide channel formed in and directed across said stopper;

at least one pin, equal in number to and positioned in said slide channels;

at least one window and slot, equal in number to the number of said slide channels, in the lip of said opening, and each aligned with one end of a different one of said slide channels;

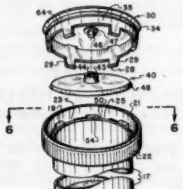
said slots being sufficiently large that said pin can be lifted through said slot;

each said pin having an enlarged portion on one end thereof sufficiently small to fit within said windows and sufficiently large that said enlarged portion cannot be lifted through said slot.

3,860,136
CHILD-RESISTANT ENCLOSURE FOR HAZARDOUS MATERIALS

Russell H. Romney, Salt Lake City, Utah, assignor to Child Resistant Packaging, Inc., Salt Lake City, Utah

Filed Jan. 30, 1974, Ser. No. 437,938
Int. Cl. B65d *55/02, 85/56;* **H61j** *1/00*
U.S. Cl. 215—222 **10 Claims**

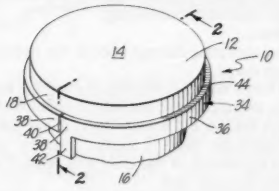


1. A safety receptacle or enclosure for hazardous materials of the character described for preventing access by small children to contents which comprises, in combination, a main container body having a peripheral wall and a bottom, said wall having a closure-receiving upper sealing rim around its opening, a cap-simulating ring secured to said container and surrounding but annularly spaced from said upper rim, first locking elements on the container body disposed between said ring and said peripheral wall, an upper carrier cap member having dependent locking elements adapted to engage cooperatively with said first locking elements by relative rotational movement, said cooperative locking elements including means for positively blocking said elements against said relative rotational movement, and resilient means associated with the carrier cap member for urging said carrier cap away from the said upper rim of the main container body, thereby forcibly holding the locking elements in locked and blocked position, said resilient means being of such strength and resilience as to apply an urging force greater than that which a small child is physically capable of overcoming.

3,860,137
PRESS-TOP TYPE CHILD-RESISTANT CLOSURE

Woodrow S. Wilson, Johnston, R.I., assignor to Polytop Corporation, Statersville, R.I.

Filed Nov. 10, 1972, Ser. No. 305,427
Int. Cl. B65d *55/02, 85/56;* **A61j** *1/00*
U.S. Cl. 215—224 **1 Claim**



1. In a closure having a top and an integral peripheral skirt, said skirt including holding means spaced from said top, said closure being adapted to be used over the end of a container neck with said top covering the end of said neck and said skirt fitting around said neck so that said holding means engages cooperating means on the exterior of said neck to prevent removal from said closure from said neck, said top being capable of being pressed at its center towards said neck in order to cause flexure in said closure resulting in expansion of said skirt and in said holding means being released from said cooperating means so that said closure can be removed from said neck, the improvement which comprises:

a ring of material extending around the periphery of said skirt, said ring of material serving to prevent expansion of said skirt upon pressure being applied to the center of said top in order to prevent said holding means from being released from said cooperating means,

said ring of material is integral with said skirt and extends beneath said skirt away from said top,

said ring of material includes a second holding means designed to engage other cooperating means on the exterior of said neck so as to securely hold said closure against removal from said neck prior to said ring being severed from said neck,

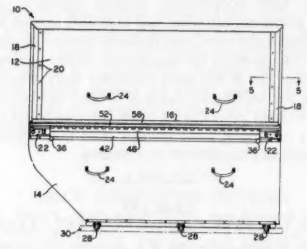
said ring of material comprises a strip of material extending around the periphery of said strip and joined to said skirt, said strip having adjacent ends adjacent to said strip, said ends being joined together and said strip being joined to said skirt by easily severed thin lines of material,

said ring of material being capable of being removed from said skirt so as to permit expansion of said skirt when said top is pressed at its center towards said neck so that after removal of said ring said closure can be removed from said neck.

3,860,138
CARGO CONTAINER LATCH AND DOOR

John W. Lovich; Oscar W. Meller, and Frank C. Morse, all of Akron, Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Jan. 4, 1974, Ser. No. 430,803
Int. Cl. B65d *87/00*
U.S. Cl. 220—1.5 10 Claims



1. A cargo container door and latch assembly for sealing the front framework of a cargo container having a top, a base, vertical door frame elements interconnecting the top and base, and a header attached to the top and interconnecting the door frame elements, comprising:

a top door;

a hinge connecting the top door to the header;

a bottom door;

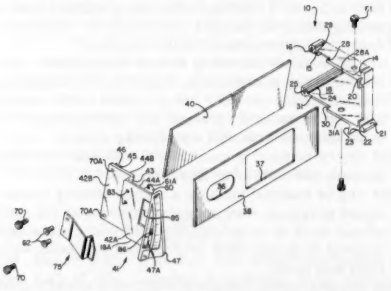
a latch-hinge assembly interconnecting the top and bottom doors, the latch-hinge assembly adaptable to fixedly interengage the top and bottom doors in one instance, separably release the doors in another instance, and allow rotational movement of one door with respect to the other in a third instance; and

a latch attached to the bottom door operative to fixedly engage the bottom door to the container framework.

3,860,139
PASSENGER AUDIO CONTROL BOX

Alan French, Warwick, R.I., and Joseph Machado, Attleboro, Mass., assignors to Avid Corporation, East Providence, R.I.

Filed Nov. 1, 1973, Ser. No. 411,783
Int. Cl. H02g *3/08*
U.S. Cl. 220—3.5 5 Claims

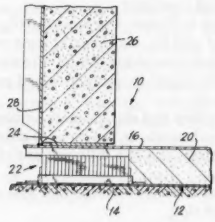


1. A passenger audio control box adapted to be mounted in a wall panel opening, comprising a body having a top wall provided with a front projection having an edge, a bottom wall having a front projection provided with a lower front edge, a front wall integrally connected to said top wall and bottom wall, a left side member having a window and a left end face plate provided with a spring release orifice, a lower front edge extension, an upper front edge extension, and a wall panel covering surface, a right side member having a window and a right end face plate provided with a spring release orifice, a lower front edge extension, an upper front edge extension, and a wall panel covering surface, two retaining spring clips, one for said left side member and one for said right side member, each retaining spring clip, comprising a base, a tension leg, offset at an angle of approximately 23° to a vertical plane passing through the base, a retaining platform bent at an angle of approximately 103° to the tension leg, and a spring release surface set at an angle of approximately 120° to the surface of the retaining platform means fastening one retaining spring clip to said left side member with the retaining platform passing through the window in the left side member, and additional means fastening the other retaining spring clip to said right side member with the retaining platform passing through the window of the right side member, and with said retaining platform parallel to said wall panel covering surface, means fastening said left side member to said top wall and said bottom wall, and means fastening said right side member to said top wall and said bottom wall.

3,860,140
BALSA WOOD FOOTING FOR LNG TANKS

Sven Hjalmar Wichman, Yaphank, and Luke Francois Debock, Fresh Meadows, both of N.Y., assignors to Preload Technology Inc., Garden City, N.Y.

Filed Mar. 19, 1973, Ser. No. 342,591
Int. Cl. B65d *87/24;* E04b *1/68*
U.S. Cl. 220—18 7 Claims



1. In a cryogenic tank construction including a subfloor, a tank floor and a wall supported above said tank floor, the improvement which comprises:

a. a foundation comprised of wood positioned between said floor and said subfloor, said wood having its grain oriented parallel to said wall;

b. restraining means for said wood positioned along the sides of said foundation and fastened to said subfloor, running essentially parallel to the course of said foundation; and

c. restraining shear key bars for said wood positioned, at intervals, transversely to the course of said foundation and attached respectively to said tank floor and said subfloor, for preventing relative tangential movement of said foundation and wall.

3,860,141
SELF-HINGING COVER FOR CONTAINER

Bob R. Hawk, Crowley, Tex., assignor to Loma Corp., Fort Worth, Tex.

Filed June 21, 1973, Ser. No. 372,276
Int. Cl. B65d *43/15, 51/10*
U.S. Cl. 220—338 8 Claims

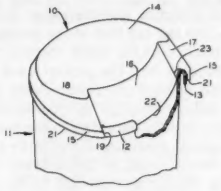
1. A self-hinging cover for an open-topped container with a peripheral rim defining the open top and which cover comprises:

a cover plate that is substantially coextensive with the open top of the container when positioned in closing relationship thereto and includes bottom surface portions en-

gageable with the container's peripheral rim in supporting the cover on the container,

a first flange formed with said cover plate and extending a distance laterally therefrom in appending relationship to project downwardly around the exterior of the container's peripheral rim, said first flange having terminal ends spaced apart defining an opening in said flange,

a second flange formed with said cover plate and extending a distance laterally therefrom in appending relationship



and relatively inward of said first flange to project downwardly into the interior of the container, said second flange being coextensive with the opening defined by the terminal ends of said first flange and angled outwardly toward said first flange, and

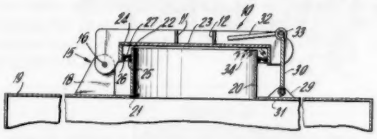
a pair of hinge flanges formed with said cover plate and extending between said first and second flanges at respective terminal ends of said first flange, each of said hinge flanges having a downwardly opening hinge-notch formed therein to pivotally engage the container's peripheral rim.

3,860,142

SELF-SEALING PRESSURIZED CONTAINER LOADING HATCH

Charles D. Jurges, Bellingham, Wash., assignor to Intalco Aluminum Corporation, Ferndale, Wash.

Filed Sept. 29, 1972, Ser. No. 293,630
Int. Cl. B65d *85/00;* **A47j** *36/06*
U.S. Cl. 220—344 **2 Claims**



1. In a pressurized container adapted for carrying bulk particulate material, such as finely divided alumina, a self-sealing loading hatch comprising,

an upstanding collar integral with and surrounding an opening in said container through which material is charged into said container,

a seal-engageable annular ledge securely fixed to the outside face of said collar,

a hatch cover for said collar hingedly connected to said container and pivotally swingable to embrace said collar in closing relationship therewith,

said cover having an inner roof and a flange depending downwardly therefrom which surrounds the collar in spaced relationship therewith when the cover is in closed position,

the inner roof of the cover being above and out of contact with the top rim of said upstanding collar,

an annular elastomeric flapper seal with its outer periphery anchored by fastening means to the inner wall of said downwardly depending flange and with its free end extending radially inwardly towards and over said-engageable ledge of said collar when the cover is in closed position,

such that when the cover is closed and said seal of said cover is in wiping contact with the seal-engageable ledge of said collar, it is held under pressure against said ledge by virtue of the air pressure within said container,

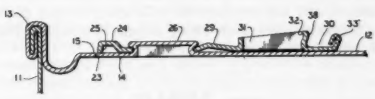
and safety latch means pivotally mounted on said container for maintaining said cover in closed position and out of contact with the upper rim of said collar, stop means being provided against which the cover bears in closed position to assure that the inner roof of the cover is maintained out of contact with the top rim of said collar, said stop means being fixed to the collar in a position beneath said annular ledge.

3,860,143

EASY-OPEN CONTAINER WITH NONDETACHED TAB

Carl J. Strobe, 5515 Whitner Dr., N.W., and Robert A. Wells, 4450 Harris Trl., N.W., both of Atlanta, Ga. 30327

Filed Dec. 29, 1972, Ser. No. 319,749
Int. Cl. B65d *17/24*
U.S. Cl. 220—269 **11 Claims**



1. A container having an easy-open feature, comprising:

a container member including a surface;

a tab defined on said surface of said container member by a region of predetermined weakness in said surface to undergo severing along said region and subsequent deformation away from said surface along a predetermined nonseverable bend line in response to the application of force to said tab;

handle means attached to a location on said tab and extending therefrom to be disposed adjacent said surface at a location whereat movement of said handle means in a direction away from said surface applies force to said tab to sever said region of predetermined weakness and bend said tab along the bend line away from said surface; and said handle means having an opening therein in predetermined spaced relation to dispose said opening in proximate alingment with the aperture which remains in said surface by severing and bending of said tab.

3,860,144

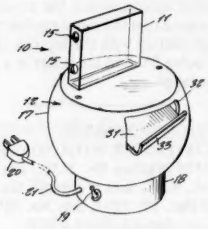
CIGARETTE CONTROL DISPENSER

Vincent Di Marzo, 16-16 N. Gardiner Dr., Bay Shore, N.Y. 11706

Filed Mar. 20, 1973, Ser. No. 342,980
Int. Cl. B65b *59/00*
U.S. Cl. 221—15 **1 Claim**

1. In a cigarette control dispenser, the combination of a hopper for containing a supply of cigarettes, a case upon which said hopper is mounted, said case containing a timer motor and a mechanism driven by said motor, said mechanism intermittantly in equally spaced time intervals dispensing said cigarettes one at a time, said hopper including at least one access opening near an upper portion thereof for re-loading cigarettes thereinto and an opening at its bottom from which said cigarettes are dropped into said mechanism, said timer motor having an output shaft that drives said mechanism, said timer motor being driven by conventional electrical or mechanical power, said mechanism comprising a rotating member mounted on said output shaft, said member having a recess that is equivalent to a length, width and thickness of one of said cigarettes, said recess aligning with said hopper bottom opening at each rotationg of said rotating member whereby only one of said cigarettes fits therein when gravity

fed from said hopper, and an inclined chute extending outwardly from said case, an inner end of said chute being in proximity with said rotating member so that when said recess is nearest said chute, said cigarette is gravity fed from said recess, upon said chute and rolled outward of said case, wherein said rotating member comprises a circular disc that



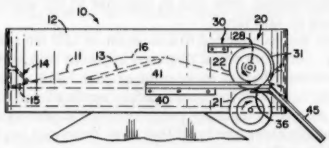
rotates about a vertical axis between an upper and lower horizontal stationary plate of said case, a space between said plates being equivalent to a clearance for said thickness of said cigarette, and one end portion of a lower of said plates over which said recess travels being angularly downward inclined to form an interior portion of said chute.

3,860,145

FULL RECYCLE CAP FEEDER

Paul Marcus Miller, Largo, Fla., assignor to Tangen Drives, Inc., Clearwater, Fla.

Filed Apr. 23, 1973, Ser. No. 353,300
Int. Cl. B65g *47/14*
U.S. Cl. 221—159 **5 Claims**



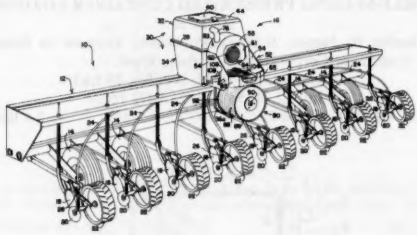
1. A full recycle cap feeder comprising, in combination,
a basic feeder unit having a central conical shaped rotor with a peripheral side wall,
a cap trap provided around the periphery of the rotor and the lower portion of the side walls having a space therebeneath to receive caps oriented upwardly and downwardly in random fashion,
a baffle mounted on and beneath said cap trap adjacent to the interior peripheral edge thereof and spaced from said peripheral side wall of said feeder unit thereby to provide a path for the end to end single file orientation of caps therebeneath,
a pickup track positioned at a tangential point along the periphery of the side wall,
a pair of counter-rotating wheels positioned with their axes parallel to each other and horizontal and perpendicular to the axis of rotation of the rotor of the feeder, including an upper recycle wheel and a lower feed wheel,
said pickup track delivering caps to the gap between the counter-rotating wheels,
a resilient rim on each wheel for engaging the caps fed thereto in such fashion that the cap will proceed in that direction in which the side walls of the cap is pointing,
motor drive means for said counter-rotating wheels including coupling means for coupling said motor drive means to said upper recycle wheel in order to drive the same,
said lower wheel being driven sympathetically through the action of said driven upper recycle wheel as caps are engaged between the said upper driven recycle wheel and the said lower feed wheel,
a delivery chute positioned downwardly of the lower feed wheel for receiving those caps having the side walls positioned downwardly,
a recycle chute surrounding the upper recycle wheel for delivering those caps having the side walls thereof pointed upwardly around to the top of the recycle wheel at which time the side wall of the cap is positioned downwardly,
means for re-orienting and thereafter delivering the recycled caps into the cap trap at the periphery of the rotary member interior of the baffle thereby to present to the re-oriented caps into the pickup track and to feed the same to the delivery chute whereupon the recycled caps will feed fully oriented to the counter-rotating wheels,
whereby caps initially delivered to the pickup track in randomly oriented configuration permits caps properly oriented to be delivered to the delivery chute for further processing while caps delivered to the delivery chute in upstanding orientation are re-oriented by said upper recycle wheel and delivered to the pickup track and hence to the cap trap for presentation to the delivery chute in properly oriented position.

3,860,146

SEED DISPENSING MECHANISM

Jack L. Bauman, Naperville, and Darlo E. Lienemann, Darien, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed July 9, 1973, Ser. No. 377,478
Int. Cl. B65h *3/08*
U.S. Cl. 221—211 **15 Claims**



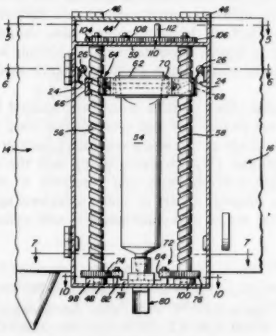
1. In a seed dispensing mechanism for a mobile planter, in combination, a framework including a stationary vertically disposed plate, an open-sided cylindrical shell mounted for rotation about a horizontal axis and having its open rim disposed in sealing relation with respect to said plate, an end wall secured to and closing the other end of the shell, said shell and end wall, in combination with said fixed plate, defining a seed-distributing drum, means for continuously depositing seeds at a deposit point adjacent said plate within said drum, means for supplying air under pressure to the drum to pressurize the same, said shell being formed with a plurality of longitudinally spaced circular rows or circumferentially spaced seed-retaining perforations which, upon rotation of the shell, receive respective unit seeds therein from the tumbling seed mass thereabove, hold the same under the influence of differential air pressure thereon, and transport the same upwardly and circumferentially of the drum for subsequent release in the upper region of the drum, means for receiving and dispensing the released seeds, and means supported by said plate and projecting therefrom, said last named means displaced from said point of deposit in the direction of rotation of said shell such that it is engageable with the seed mass, and effective incident to rotation of the shell for impelling portions of such seed mass along the drum and into overlying relationship with respect to the perforations which move beneath such

seed mass in the circular row of depressions furthest from said deposit point.

3,860,147
DENTAL HYGIENE DISPENSER

Robert J. Vessio, 10 Ashwood Dr.; Frank E. Valeri, 213 Lorraine Pl.; George W. Leask, Suburban Rd., all of Brick Town, N.J., and Richard W. Peterson, Center Dr., Manasquan, N.J. 08723

Filed May 10, 1973, Ser. No. 358,934
Int. Cl. B65d *35/54*
U.S. Cl. 222—96 **9 Claims**

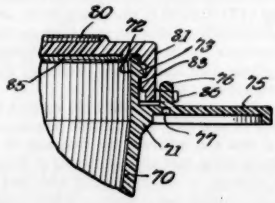


1. In a dispenser having means for mounting a collapsible container and means for engaging a container and selectively dispensing a material from same, the engaging means including a mechanism for changing linear motion to rotary motion, the improvement wherein the mechanism includes a pair of rotatably mounted gear wheels, a support member slidably mounted and arranged for reciprocating movement, a pair of racks pivotally mounted on the support member and arranged for engaging the gear wheels, and means for resiliently biasing the racks against the gear wheels, the racks engaging and turning the gear wheels in one direction of movement of the support member and riding over the gear wheels in the return direction of movement.

3,860,148
LIQUID CONTAINER

Michael H. Sherin, Fontana, Wis., assignor to Sage Products, Inc., Elk Grove, Ill.

Filed Apr. 6, 1973, Ser. No. 348,487
Int. Cl. B67b *5/00*
U.S. Cl. 222—153 **3 Claims**

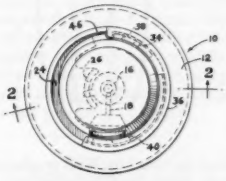


1. A sterile specimen container comprising:
hollow receptacle means for receiving the specimen including a side wall integrally joined to a bottom wall, a circular rim portion integrally joined to said side wall and and external thread means provided on said rim portion;
closure cap means including skirt portion defining a skirt rim and having internal thread means threadably engaging said external thread means on said receptacle; circular flange means provided on said receptacle means and engageable with said skirt rim as said cap means is threadably advanced onto said receptacle means;
at least three support legs depending downwardly from said skirt portion of said cap means and spaced radially outwardly from said skirt rim to permit said skirt rim to engage said flange means, said support legs defining a support plane for said cap means spaced from said skirt rim with said cap means separated from said receptacle means, whereby said skirt rim is separated from contaminants by said legs; and
a sealing system for indicating the sealed and sterile condition of said container comprising a frangible detent positioned on one of said cap and receptacle means adjacent the interface between said cap and receptacle means, and abutment means provided on the other of said cap and receptacle means and arranged to engage with and shear said detent as said cap and receptacle means are rotated with respect to each other on said thread means, whereby the presence of said detent on said container indicates the sterility of said container;
said cap and receptacle means further being constructed from material having relative flexibility which permits said cap means to be forced onto said receptacle rim portion over said external thread means to seal said container and position said detent in operative relationship with respect to said abutment means and further to operatively engage said internal and external thread means.

3,860,149
CHILDPROOF ACTUATOR

Ernest John Hagianis, Manchester, N.H., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Continuation of Ser. No. 318,016, Dec. 26, 1972, abandoned.
This application Feb. 24, 1974, Ser. No. 446,150
Int. Cl. B65d *83/14*
U.S. Cl. 222—153 **2 Claims**



1. An aerosol container having at one end a vertically reciprocable or tiltable valve mounted in a mounting cup having a valve pedestal, the valve having an upwardly directed cylindrical discharge means, the pedestal being surrounded by a ring defined by the rolled end portions of the valve mounting cup and the container, and an actuator, the actuator comprising:
a. a plastic molded collar having an annular wall engaging the ring and attached thereto, the collar having a blocking portion of a predetermined height engaging on its bottom with the top of the valve pedestal, the blocking portion being disposed only on one side of the stem;
b. a molded plastic actuator button having a discharge passage inlet in the underside thereof and interfitting with the cylindrical discharge means and rotatably but frictionally engaged therewith, the button having a depending finger adjacent the discharge passage inlet adapted when the finger is in vertical alignment with the blocking portion to block depression of the button; and
c. a releasable lock for locking the collar and button with the finger and blocking portion in such relatively aligned

blocked relation, the lock comprising a cooperating cam element and follower element, one of said elements being disposed on the inner surface of the collar and the other of said elements being disposed on the outer surface of the button, the cam element comprising a peripheral rib on one of the surfaces extending toward the other of the surfaces and gradually increasing in pronouncement toward one of the ends of the cam element and having a notch adjacent said end, the follower element comprising a projection from the other of the surfaces directed toward the said one surface, the projection being disposed in the notch at a relative position of rotation of the collar and button at which the finger is vertically aligned with the blocking portion.

3,860,150

AEROSOL DISPENSER FOR FLUID PRODUCTS COMPRISING A PISTON PUMP ASSEMBLY FOR GENERATING COMPRESSED AIR SERVING AS PROPELLANT AND A PRODUCT METERING DEVICE

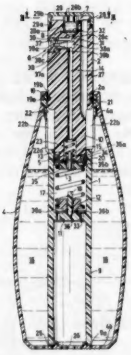
Christian Maier, Munich, Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 20, 1973, Ser. No. 426,757

Claims priority, application Switzerland, Dec. 22, 1972, 18730/72

Int. Cl. B67d *5/54*

U.S. Cl. 222—193 **9 Claims**



1. An aerosol dispenser for fluid products, comprising container means for product to be dispensed,

a piston pump separately from the product container and having a piston and a cylinder and an air compression space therein,

a spray nozzle in which compressed air flowing therethrough aspirates, and from which it sprays, product in aerosol form,

duct means for compressed air flow, extending as a flowpath from said piston pump to said spray nozzle,

compressed air flow-controlling valve means in said flowpath and comprising a valve member movable in a valve housing and obturating the compressed air flowpath when closed,

a product flowpath separate from said compressed air flowpath,

product flow control means in said product flowpath,

engaging means provided between said compressed air flow-controlling valve means and said cylinder, which engaging means comprises an abutting part on the inside of the end wall of the compression space in said cylinder and a projection of said valve member extending out of the front face of said piston facing toward said compression space end wall when out of contact with said abutting part, and

a product metering device mounted on the said piston adjacent said spray nozzle in said product flowpath;

said product flow control means comprising a valve member biassed toward closed position and being

provided with abutting means in an open end of said compressed air flow duct in said piston, said valve member comprising contact rod means extending through said air flow duct and engaging said abutting means of said product flow control means and thereby opening the product flowpath, when said abutment means in the piston pump act on the valve body of said compressed air flow-controlling valve means;

wherein at least the front end part of said piston extending into said cylinder constitutes the said valve housing of the compressed air flow-controlling valve means, said spray nozzle is fixedly mounted in said piston, and said duct means for compressed air flow extends through the piston,

said product flow control means are located between said metering device and said spray nozzle, said product container means comprises a product reservoir surrounding the cylinder of said piston pump and the said product flowpath extends from said reservoir to said metering device through a part of said piston sealingly separated from the air compression space in said cylinder.

3,860,151

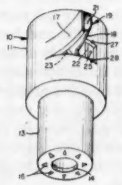
FLEXIBLE SPOUT CLOSURE DEVICE

George A. Moen, 827 W. 26th Ave., Anchorage, Alaska

Filed Apr. 12, 1973, Ser. No. 350,542

Int. Cl. B67d *3/00*

U.S. Cl. 222—513 **3 Claims**



1. A unitary closure and pouring device for a fluid-receiving container having a neck portion, said unitary device including

a. a cylindrical body portion (**11**) formed of flexible material and containing a cavity;

b. a cylindrical neck portion (**13**) integral with one end of said body portion, said cylindrical neck portion being adapted for insertion within the neck portion of the container and containing a passage (**14**) for providing communication between the container and said cavity;

c. means for discharging fluid from said cavity, comprising

1. a flap (**17**) defined in the side wall of, and extending circumferentially relative to, said body portion, said flap being operable between closed and open positions generally coplanar with and radially extending from said side wall, respectively; and

2. a flexible pouring conduit (**19**) carried by the inner surface of said flap, said flexible pouring conduit having at one end adjacent the free end of said flap an outlet opening, said conduit having at the other end an inlet opening in communication with said cavity;

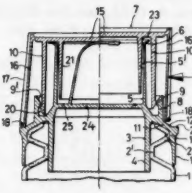
d. means for closing said pouring conduit when said flap is in the closed position, comprising means defining on said cylindrical body portion an integral recessed wall portion (**22**) adapted to cooperate with the free end of said flap portion, when said flap portion is in the closed position, to pinch therebetween said flexible pouring conduit and thereby close said outlet opening; and

e. resilient lip means (27, 28) for retaining said flap in the closed position, said resilient lip means including at least one resilient lip formed on said body portion for locking cooperation with the external surface of said flap when said flap is in the closed position.

3,860,152
CLOSURE FOR CONTAINERS

Peter Marti, Passwangstrasse 57, Breitenbach, Switzerland (4226)

Filed June 6, 1973, Ser. No. 367,375
Claims priority, application Switzerland, June 7, 1972, 8444/72
Int. Cl. B65d *41/18*
U.S. Cl. 222—545 **8 Claims**

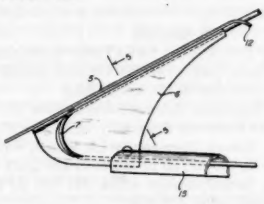


1. A container closure comprising pouring means on a container, said pouring means including a pouring nozzle, a cap engaging edge, and a lifting surface, said lifting surface extending obliquely inwardly and upwardly, and a closure cap for cooperation with said pouring means, said closure cap including an outer elastically deformable cap jacket having a lower edge comprising a support rim for cooperation with said lifting surface, said closure cap further including a snap-in device for copperation with said cap engaging edge on said pouring means, said closure cap having a portion thereof engaging portions of said pouring means in sealing engagement therewith, said deformable cap jacket upon deformation causing said support rim to engage said lifting surface thereby causing said closure cap to move upwardly as the deformable cap jacket is moved inwardly so as to disengage said snap-in device from said cap engaging edge on said pouring means to release said closure cap.

3,860,153
COAT HANGER SHOULDER SUPPORT ATTACHMENT

George B. Davis, Jr., 7512 Marbury Rd., Bethesda, Md. 20034

Filed Nov. 1, 1973, Ser. No. 411,716
Int. Cl. A47j *51/086*
U.S. Cl. 223—88 **5 Claims**

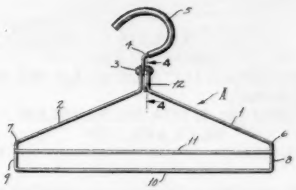


1. Shoulder pad support attachments for connecting with a conventional bent wire coat hanger having sloping garment shoulder supporting surfaces connected by curved ends to a horizontal cross-member said support attachments comprising shoulder supporting plates disposed for resting upon the sloping shoulder supporting surfaces of the hanger and adapted to extend beyond the curved ends of the hanger, each support having loop means depending from said plate and adapted for telescoping over the curved end of the hanger to closely bear along with said plate against the contacted surfaces of the hanger when moved to seating position upon the hanger, a tab formed upon said loop means and movable out of the plane thereof and positioned to lock behind the curved end of the hanger to fixedly secure said attachment to the hanger as the attachment is telescoped to seating position over the hanger.

3,860,154
GARMENT HANGER

Jack Atkins, 4408 Cherrydale, Memphis, Tenn. 38111

Filed July 11, 1973, Ser. No. 378,155
Int. Cl. A47j *51/084*
U.S. Cl. 223—88 **6 Claims**

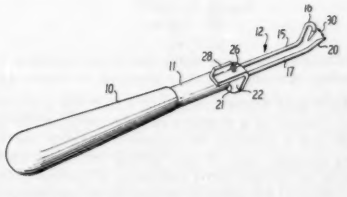


1. In a garment hanger for use while traveling and for supporting a suit of clothing in addition to at least one shirt hanger, comprising, a garment hanger having a pair of inclined portions, at least one rod spanning the spacing between the proximate downward ends of the inclined portions and being integrally connected thereto, a handle portion having a looped downward end, and a retainer means, both said handle portion and retainer means being contiguous with one another and being pivotally connected to the upper ends of said inclined portions, the upper ends of said inclined portions each formed having an integral loop, said looped ends being arranged embracing the contiguous handle portion loop and the retainer means, a fastener means, said fastener means holding said handle portion and retainer means pivotal with respect to said looped ends of the inclined portions, said retainer means comprising an elongated member and having a first aperture therein with said fastener means being inserted therethrough, said retainer means having a second aperture therethrough for insertion of the shirt hanger for providing its support, said retainer means capable of pivoting downwardly as when not in use, and said retainer means capable of being pivoted substantially laterally for insertion of the shirt hanger through its second aperture when providing its support.

3,860,155
LATCH HOOK DEVICE

Crescent A. Migliaccio, 6210 Wagner Ln., Fairway Hills, Md. 20023

Filed June 7, 1973, Ser. No. 368,044
Int. Cl. A41h *31/00*
U.S. Cl. 223—104 **8 Claims**



1. A latch hook device which comprises:
supporting means;
a hook member extending from said supporting means, said hook member including a shank portion extending out-

wardly from said supporting means and a hook portion extending from the end of said shank portion, said hook portion extending at an angle relative to said shank portion;

a pivot bar extending from said supporting means having an axis of rotation substantially parallel to said shank portion, a latch part extending from said pivot bar and at an angle relative thereto, the outer portion of said latch bar engaging said hook portion;

means for selectively rotating said pivot bar whereby said latch part where it engages said hook portion is selectively rotatable away from said hook portion through an arc of motion wherein a plane containing said arc of motion is perpendicular to the axis of rotation of said pivot bar.

3,860,156
DRESSING AID

Frederick R. Lawrence, 1627 S. 6th St., Apt. 902, Minneapolis, Minn. 55404

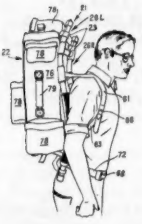
Filed Apr. 5, 1974, Ser. No. 458,218
Int. Cl. A47j *51/06*
U.S. Cl. 223—111 **10 Claims**

1. An easily manipulated dressing aid for releasably grasping a stocking to enable the stocking to be pulled over one's foot, the aid comprising a pair of elongated supports having generally opposed, adjacent proximal and distal ends, a transverse lug at the distal end of one support, and a lug-fitting hook having proximally divergent arms hinged to the distal end of the other support, the lug and hook having coacting camming surfaces positioned to mutually engage and hingedly swing the hook away from the lug as the hook-bearing support is moved distally with respect to the lug-bearing support.

3,860,157
BACK PACK AND FRAME

Peter G. Richards, 1021 Castro St., San Francisco, Calif. 94114; David R. Mullen, 5263 College Ave., No. 6, Oakland, Calif. 94618, and Douglas E. Hall, 645 Elizabeth St., San Francisco, Calif. 94114

Filed July 31, 1972, Ser. No. 276,455
Int. Cl. A45f *3/08*
U.S. Cl. 224—8 R **4 Claims**

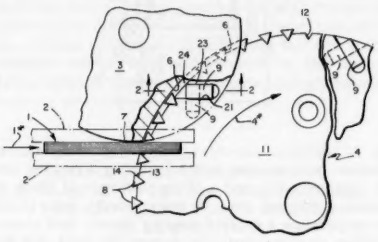


1. A back pack frame comprising a first side and a second side each formed of a plurality of polyvinyl chloride tubular members and a plurality of polyvinyl chloride tee fittings receiving opposite ends of said tubular members, each said side having an upward and a downward extension fitting into the uppermost and lowermost of said tee fittings respectively, said extensions adapted to receive loops on the top and bottom of a pack supported by said frame to hold said pack and frame assembled, at least two transverse tubular members, each said transverse member having one of its ends received in an opening of a tee fitting of said first side and its opposite end received in an opening of a tee fitting of said second side, stretchable netting extending across said transverse members around said sides and cord through holes in margins of said netting drawing edges of said netting inward to draw said sides toward each other, said netting and friction of the ends of said transverse members in said tees being the sole means of holding said transverse members and said sides assembled, said tubular members being bent to fit the back of the wearer of said frame and being bendable when heated to adjust the fit of said members to the wearer's back.

3,860,158
BOOK ROUGH CUTTER WITH RAKER TOOTH

Peter Aspinwall, Carlisle, Mass., assignor to Comstock & Wescott, Inc., Cambridge, Mass.

Filed June 4, 1973, Ser. No. 366,464
Int. Cl. B26d *1/14;* **B26f** *3/02*
U.S. Cl. 225—94 **7 Claims**



1. A cutting wheel for roughing the backbone leaf edges of an unbound fibre paper book comprising:

a planar disk rotatable in a given direction;

a plurality of cutting teeth spaced around the disk, each tooth including a leading surface with a cutting edge extending transverse the disk plane, the leading surface having a radially inward inclination in one direction with respect to disk rotation so as to twist partially detached paper fragments at the leaf edges in one direction; and

at least one raker tooth on the disk having a raking edge substantially coplanar with one end of the cutting edge, the raker tooth being inclined at an angle deviating oppositely to the radially inward inclination of the leading surface so as to twist the partially detached fragments oppositely to the twist of the leading surface and tear the fragments from the book leaves leaving a substantially continuous rough, fibrous edge on the leaves.

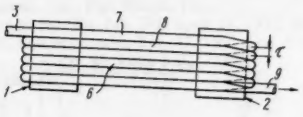
3,860,159
METHOD OF CREATING TREATING ZONE FOR MULTISTAGE TREATMENT OF FLEXIBLE LONG-LENGTH ARTICLES

Lev Romanovich Shkundin, Zelenodolskaya ulitsa 15, korpus 1, kv. 66; Roman Pavlovich Braginsky, ulitsa Krasny Kazanets 7, kv. 16; Eduard Emmanuilovich Finkel, ulitsa Fermana 7, korpus 1, kv. 47, all of Moscow, and Jury Nikolaevich Leontiev, Industrialnaya ulitsa 31, kv. 3, Podolsk Moskovskoi oblasti, all of U.S.S.R.

Filed July 3, 1973, Ser. No. 376,208
Int. Cl. B65h *23/22*
U.S. Cl. 226—4 **1 Claim**

1. A method of creating a treating zone for the multi-stage treatment of flexible long-length articles comprising the steps of: successively passing each said article about peripheral portions of at least two drums having parallel axes of rotation so as to form turns of said article; arranging portions of the turns of said article simultaneously between said drums normally to the generating lines of said drums extending through

the points of contact between said article and said drums; moving said article along the longitudinal axis thereof; and



concurrently shifting the portions of said article in contact with the peripheries of said drums along the axis of at least one of said drums.

3,860,160

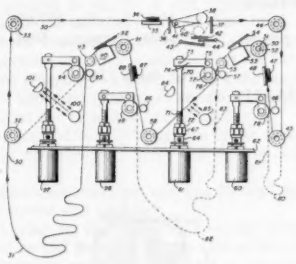
DUAL RECORDING AND REPRODUCING APPARATUS

James J. Bucaholz, 2411 Euston Rd., Winter Park, Fla. 32789, and Edward E. Peyton, 220 Glen Oaks Ave., No. 102 Temple Ter., Tampa, Fla. 33617

Division of Ser. No. 169,913, Aug. 9, 1971,. This application Aug. 1, 1973, Ser. No. 384,626. U.S. Patent No. 3,766,326

Int. Cl. B65h *17/20*

U.S. Cl. 226—177 **6 Claims**



1. A tape drive mechanism adapted for use in a recording and reproducing machine comprising in combination:

a. rotatable drive shaft means for driving a tape pressed thereagainst;

b. pinch roller means adapted to press magnetic tape against said rotatable drive shaft for driving said tape;

c. lever means having two end portions and being movably attached to a point between said end portions and having said pinch roller means attached to one said end portion thereof and being adapted to swing on said lever means to engage and disengage said tape against said drive shaft means;

d. adjustable rod means movably attached to the other end of said lever means;

e. threaded means attached to said adjustable rod means for adjustment thereon; said threaded means having a protruding tongue on one side thereof for engaging a yoke on said plunger rod and said yoke and tongue are movably pinned together;

f. solenoid means having a plunger rod, said plunger rod being attached to said threaded means whereby rotation of said threaded means will rotate said plunger rod in said solenoid means for threading said rod means into and out of said threaded means and actuation of said solenoid will drive said pinch roller means toward said drive shaft.

3,860,161

CARTRIDGE TOOL WITH POCKET ARRANGED UNDER THE BARREL

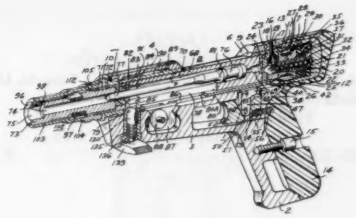
Per Ingemar Engstrom, Vastervik, and Erhard Rudolf Boye, Gunnebobruk, both of Sweden, assignors to Gunnebo Bruks Aktiebolag, Gunnebobruk, Sweden

Filed Feb. 1, 1973, Ser. No. 328,640

Claims priority, application Sweden, Feb. 7, 1972, 1354/72

Int. Cl. B25c *1/14*

U.S. Cl. 227—10 **4 Claims**



1. In a cartridge tool including a cartridge chamber for receiving cartridges and communicating with a barrel which axially guides a striker piston, the barrel being circumferentially surrounded by a housing and extending beyond the end of the housing, the housing being spaced from the barrel to define an annular region and being fixed to a support member which includes the handle of the tool, the improvement comprising, an opening in the barrel adjacent to the cartridge chamber, a cyclonic type soot trap in the support member having an entrance opening which communicates with the opening in the barrel, the soot trap being configured with a circular wall and a central post to induce vortex motion in gases entering the entrance opening and the soot trap having an exit opening which communicates with the region between the barrel and the housing whereby the gases entering the soot trap are constrained to circle one full time before exiting.

3,860,162

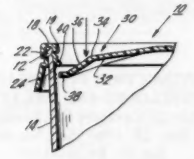
NON-SPILL DRINKING CUP TOP

Frank C. Schutz, Downey, Calif., assignor to Nospil Limited, Los Angeles, Calif.

Filed Oct. 10, 1972, Ser. No. 295,978

Int. Cl. B65d *1/08, 3/00, 5/00*

U.S. Cl. 229—7 R **3 Claims**



1. A container cover which has a lip-operated valve therethrough which is normally closed to prevent spillage, and which can be pressed open by the lip of a user; said container cover comprising;

a sheet of thin flexible resilient material for covering the open end of a container;

a circular rim enclosing the outer periphery of said sheet for removably engaging the open end of a container;

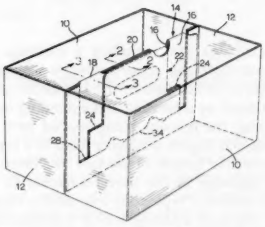
an arcuate slit extending through said sheet, the center of the length of said slit being located close to said rim, with said slit curving away from said rim as it extends from its said center;

a raised sheet region integral with said sheet and extending above the general surface of said sheet and adjacent to said circular rim and being partly enclosed by said slit; said raised sheet region having a normal rest position relative to said sheet to close said slit, whereby depression of said raised sheet region by the upper lip of a user causes the relative lateral movement of the opposing edges of said slit to open said slit and to permit the movement of fluid material through said slit, and whereby said slit is reclosed when the user's lip releases said raised sheet region.

3,860,163
DIVIDER CONSTRUCTION

Ernest James Dewhurst, 29 Euphrasia Dr., Toronto, Ontario, Canada (M6B 3V8)

Filed Sept. 27, 1973, Ser. No. 401,405
Int. Cl. B65d *5/46, 25/22, 25/28*
U.S. Cl. 229—52 R **5 Claims**



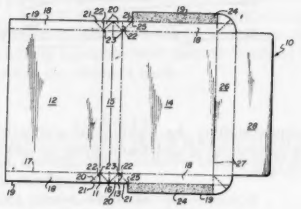
1. A divider construction for a paperboard container comprising an envelope and a handle having a grip portion, said grip portion of said handle being movable into and out of said envelope, said envelope including an anchor panel for said handle, said handle and said anchor panel each having a parting edge, said parting edge of said handle being in juxtaposed relation to said parting edge of said anchor panel, tearable joining means integrally formed with said handle and with said anchor panel joining said handle to said anchor panel characterized by a bar formation that joins said handle and said anchor panel, one end of said bar formation being spaced from the other end of the bar formation in the direction of the parting edges whereby when said handle is separated from said anchor panel in a direction across the direction of said parting edges, said bar is twisted and tears whereby said handle becomes separated from said anchor panel.

3,860,164
END CONSTRUCTION FOR BELLOWS TYPE ENVELOPES AND THE LIKE

Howard S. Dworkin, 26 Coventry Rd., Livingston, N.J. 07039

Filed Dec. 28, 1967, Ser. No. 694,141
Int. Cl. B65d *33/00*
U.S. Cl. 229—61 **10 Claims**

1. An end construction for a bellows-type envelope comprising a sheet having an outward and inward surface, a front wall, a bottom wall, and a back wall defined by first inward fold lines on a sheet, side walls defined by second inward fold lines on a sheet, said side walls defining a continuous longitudinal flap on both sides of the front wall, bottom wall and back wall, isosceles triangles defined by third inward fold lines on the side walls, the third inward fold lines being astride the first inward fold lines, and latitudinal extensions coextensive with a portion of each flap and defined by outward longitudinal fold lines, the flaps being folded over respective front, bottom and back walls, the front and back wall folded over in registration with each other and the bottom wall folded outwardly upon itself, the opposing faces on the outward side of each of the triangles being folded together and secured together, the

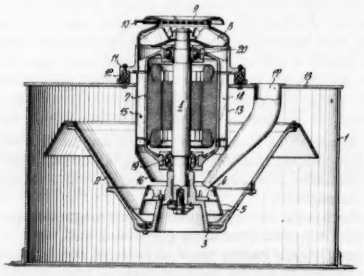


latitudinal extension being secured to said continuous flaps at portions not coextensive with said latitudinal extensions.

3,860,165
CENTRIFUGE AND METHOD OF OPERATING THE SAME

Bernhard Fiedler, Grevenbroich, Germany, assignor to Maschinenfabrik Buckau R. Wolf Aktiengesellschaft, Grevenbroich, Germany

Filed Sept. 13, 1973, Ser. No. 397,098
Claims priority, application Germany, Sept. 14, 1972, 2245019
Int. Cl. B04b *15/02*
U.S. Cl. 233—11 **10 Claims**

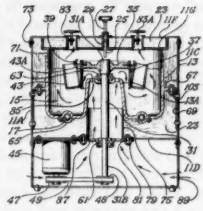


1. A centrifuge, particularly a sugar centrifuge, comprising an upright centrifuge basket having a lower end and an upwardly diverging interior cross-section; an accelerator member connected to said basket in the region of said lower end for accelerating material being centrifuged; an electromotor at least in part above said basket and having an output shaft which extends into the same and is connected with said accelerator member for rotating said basket, said electromotor having cooling fins; and an air-guide sleeve surrounding said electromotor and shaft and having a lower open end in the region of said accelerator member, so as to direct air heated in said electromotor onto the material being centrifuged in said basket.

3,860,166
APPARATUS FOR SEPARATING MOISTURE FROM SOLIDS

Bazeel B. Anderson, Fort Worth, Tex., assignor to Anderson Laboratories, Inc., Fort Worth, Tex.

Division of Ser. No. 245,201, April 18, 1972, Pat. No. 3,813,928. This application Dec. 17, 1973, Ser. No. 425,305
Int. Cl. B04b *5/02, 15/02*
U.S. Cl. 233—11 3 Claims



1. An apparatus for use in separating moisture from solids forming a material to be tested comprising:

outer wall structure forming side walls, a bottom, and a top, interior wall structure spaced from said outer wall structure and providing an interior chamber,

a door coupled to the top of said apparatus for providing access to said chamber,

said interior chamber having an inverted bowl shaped central portion extending upwardly from the bottom of said interior chamber to a position below the level of the top of said apparatus forming an annular chamber portion at the lower end of said interior chamber,

a heater located in said apparatus at the bottom of said annular chamber portion for heating said interior chamber,

insulation located between said interior wall structure and said exterior wall structure,

a shaft having one end extending upwardly through the top of said central portion and into said interior chamber,

rotatable means connected to the top of said shaft for rotation therewith,

said rotatable means comprising a top wall connected to the top of said shaft at a position spaced above the top of said central portion and having side walls extending downward therefrom to a level below the level of the top of said central portion and which surround the top portion of said central portion and are spaced radially outward therefrom,

means for pivotally coupling to said rotatable means on the outside of its side walls, a plurality of cup-shaped containers for holding the material to be tested,

said cup-shaped containers being adapted to have their bottom ends moved by centrifugal force in a direction away from said shaft upon rotation of said shaft and said rotatable means,

drive means coupled to the opposite end of said shaft for imparting rotation thereto for rotating said rotatable means and said containers in said chamber, and

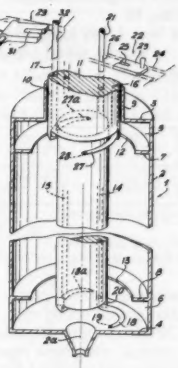
air inlet means formed through the top of said central portion and air outlet means formed through the top of said apparatus to allow air flow into said interior chamber by way of said air inlet means and out of said interior chamber by way of said air outlet means,

said top and side walls of said rotatable means acting to direct the air entering through said air inlet means to flow downward over said heater for the passage of heated air upward and around said cup-shaped containers and out of said interior chamber through said air outlet means.

3,860,167
DEVICE FOR SAMPLING GAS WITHIN THE ROTATING BOWL OF A CENTRIFUGE

Pierre Lascoux, Plaisir, France, assignor to Commissariat a L'Energie Atomique, Paris, France

Filed Jan. 10, 1973, Ser. No. 322,354
Claims priority, application France, Jan. 19, 1972, 72.01696
Int. Cl. B04b *11/08*
U.S. Cl. 233—22 9 Claims

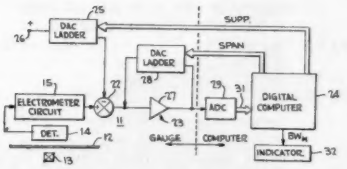


1. A device for sampling gas comprising a rotating bowl of a centrifuge, a stationary column mounted on the axis of the rotating bowl, at least one transfer tube for the sampled gas, mounted on said column, a scoop connected to said tube and extending transversely within a sampling chamber at one end of the bowl, said scoop being displaceable between a withdrawn position in which it is wholly contained within the column and an outwardly-extended position in which said scoop projects with respect to said column within the sampling chamber and means for providing a relative displacement of said tube with respect to said column.

3,860,168
PLURAL RANGE GAUGE

Robert V. Byrd, and Clyde P. Mason, Jr., both of Columbus, Ohio, assignors to Industrial Nucleonics Corporation, Columbus, Ohio

Filed Oct. 13, 1971, Ser. No. 188,712
Int. Cl. G01n *33/34*; G06j *3/00*
U.S. Cl. 235—151.3 72 Claims



1. In combination, a nucleonic detector for deriving a first signal substantially exponentially related to a process variable being monitored by the detector, first means for determining in which one of a plurality of signal amplitude ranges the first signal falls, means responsive to the determination for transforming the first signal into a second signal having approximately a linear variation as a function of the property over each of the ranges, said second signal extending between the same first and second limits in each of said ranges, and means

responsive to the second signal for deriving a third signal having a magnitude BW_T in accordance with

$$BW_T = ax + b$$

where:

x = the magnitude of the second signal,

a and b are constants dependent on the determination such that BW_T is a continuous straight line function over all of the ranges taken together.

3,860,169

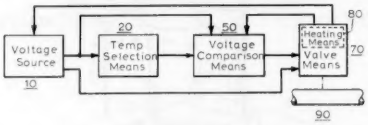
AMBIENT TEMPERATURE CONTROL SYSTEM

Robert J. Norman, Chicago, Ill., assignor to Powers Regulators Company, Skokie, Ill.

Filed Nov. 7, 1973, Ser. No. 413,540

Int. Cl. G05d *23/02*

U.S. Cl. 236—68 C **21 Claims**



1. A structure for controlling ambient temperature comprising:

a chamber containing thermal-expansive material;

a piston, slidably secured within said chamber and movable outwardly therefrom upon expansion of said thermal-expansive material; said piston regulating fluid flow outside said chamber and said fluid flow controlling ambient temperature;

heating means, secured outside said chamber, responsive to the production of an effectuation signal, and adapted to heat said thermal-expansive material; and

temperature-sensitive resistance means, secured outside said chamber in thermal relationship with said heating means, having a temperature threshold level; said temperature-sensitive resistance means causing said heating means to respond to said effectuation signal when the temperature of said heating means crosses said temperature threshold level.

3,860,170

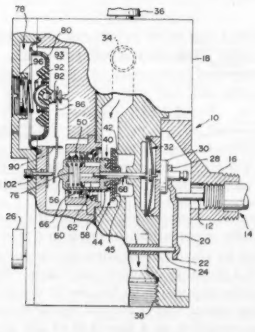
COMBINATION THERMOSTAT AND REGULATOR VALVE DEVICE

Jay R. Katchka, Cypress, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed June 18, 1973, Ser. No. 371,016

Int. Cl. G05d *27/00*

U.S. Cl. 236—92 A **18 Claims**



1. A combination thermostat and regulator device for controlling fuel flow to an appliance in response to movement of a temperature responsive device comprising a casing having an inlet for receiving fuel from a supply and an outlet for supplying fuel to the appliance; valve means including a valve seat formed in said casing and a valve member cooperating with said valve seat to control fuel flow through said casing between said inlet and said outlet; closure means controlling said valve member and movable in response to movement of the temperature responsive device to move said valve member against said valve seat to place said valve means in a closed state and to move away from said valve member to permit said valve member to move away from said valve seat to place said valve means in an open state; and regulator means including diaphragm means movable in response to pressure at said outlet and means engaging said diaphragm means and said valve means to transmit movement of said diaphragm in response to outlet pressure to said valve member when said valve means is in said open state to regulate pressure at said outlet whereby said valve means is responsive to said operator means and said regulator means to provide thermostat and regulator operation; said valve means including an operating member carrying said valve member and said regulator means including lever means pivotally mounted on a fulcrum in said casing and having a first end movable with said diaphragm means and a second end engaging said operating member to move said valve member to regulate pressure at said outlet.

3,860,171

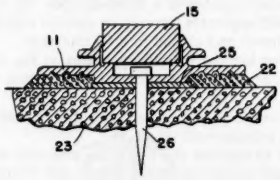
TRACK SUPPORTING MEANS

Pasquale J. Mastronardi, Northfield, assignor to Estey Corporation, Red Bank, N.J.

Filed Sept. 24, 1973, Ser. No. 399,706

Int. Cl. E01b *9/42*

U.S. Cl. 238—304 **9 Claims**



1. A track supporting means for clamping a track rail into a load bearing position comprising: a generally flat strip of metal for setting into the surface of a floor; two vertically extending bars formed integral with the flat strip for positioning a metal rail therebetween; each of said bars formed with an inwardly extending bead for engaging the sides of the rail; a longitudinal channel formed in the middle of the strip for equalizing the weight distribution applied to the rail; an outwardly extending flange formed integrally on each of the bars to add strength to the bars; and a supporting quantity of grout positioned under each of said flanges for holding the rail is resilient engagement.

3,860,172

AUTOMATIC IRRIGATION APPARATUS

Ethan A. Platt, 341 Andrews St., Livermore, Calif. 94550

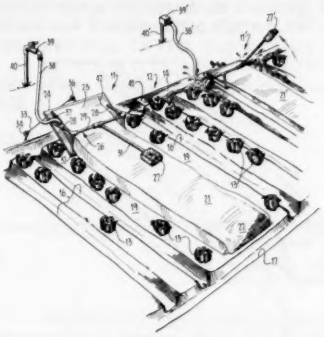
Filed June 14, 1972, Ser. No. 262,728

Int. Cl. A01g *25/00, 27/00*; **B05b** *17/04*

U.S. Cl. 239—65 **8 Claims**

1. Irrigation apparatus for automatically discharging a predetermined volume of water into an irrigation system, comprising means for collecting said predetermined volume of water; means for automatically discharging said water periodically from said collection means into said irrigation system in response to the volume of water in said collecting means reaching said predetermined volume; means for directing a

generally continuous flow of water into said water collecting means to periodically provide said predetermined volume of water in said collecting means for discharging to said irrigation system at time intervals generally dependent on the rate of



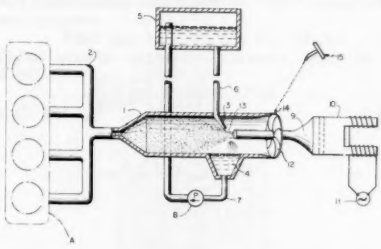
flow of said water into said collecting means, said means for directing a generally continuous flow of water into said water collecting means including an inlet into said collecting means adapted to receive a hose for conveying said generally continuous flow of water thereto.

3,860,173

NON-POLLUTING COMBUSTION ENGINE HAVING ULTRASONIC FUEL ATOMIZER IN PLACE OF CARBURETOR

Naoyasu Sata, 80 Yamate Machi, Ashiya, Japan

Continuation-in-part of Ser. No. 187,950, Oct. 12, 1971, abandoned. This application Mar. 27, 1974, Ser. No. 455,350
Claims priority, application Japan, Dec. 21, 1970, 45-11410
Int. Cl. B05b *17/06*
U.S. Cl. 239—102 **6 Claims**



1. A non-carburetor-type internal combustion engine system comprising:

an intake manifold; and

ultrasonic atomizer means for supplying atomized fuel to said intake manifold, said ultrasonic atomizer means comprising:

a horizontal atomizing chamber connected at one end thereof to said intake manifold;

an ultrasonic ferrite transducer;

an exponentially shaped resonator having the large end thereof attached to said transducer and the small end thereof having a vibrating head thereon and extending into said atomizing chamber and facing said one end of said atomizing chamber connected to said intake manifold;

a lightweight, power transistor ultrasonic wave generator means attached to said ultrasonic ferrite transducer for imparting vibrations thereto;

fuel inlet means extending through the top of said atomizing chamber to a position directly above said vibrating head for supplying a constant amount, greater than required by said engine, of fuel to said vibrating head, whereby the thus supplied fuel contacts said vibrating head and is fully atomized thereby;

air inlet means in said chamber for allowing passage therein of air to mix with said atomized fuel and to pass therewith into said intake manifold; and

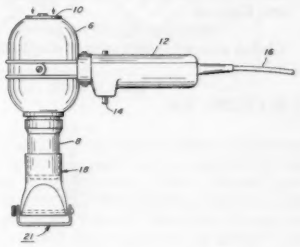
fuel tray means in the bottom of said atomizing chamber at a position below said vibrating head for receiving fuel not sucked into said intake manifold.

3,860,174

HAIR DRYER NOZZLE

Daniel Cercone, 4720 Liberty Ave., Pittsburgh, Pa. 15224

Filed Dec. 10, 1973, Ser. No. 423,213
Int. Cl. A45d *20/12;* **B05b** *15/04, 1/14*
U.S. Cl. 239—135 **3 Claims**



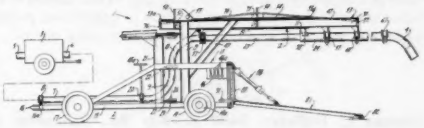
1. A blower nozzle adapted to fit on a hand dryer for hair comprising a cylindrical portion connected to the outlet of said hand dryer, a nozzle portion connected to said cylindrical portion and having converging opposite side walls terminating in an elongated restricted opening, and a deflector carried on said nozzle portion and adapted to deflect air passing through said restricted opening to the right or left of said opening, said deflector comprising a baffle having a first portion extending along said opening and spaced therefrom, and portions at the ends of said first portion at substantially right angles thereto and hinged to said nozzle portion whereby the deflector may be rotated about its hinged connection to the nozzle portion.

3,860,175

MOBILE CONCRETE DISTRIBUTING BOOM APPARATUS

Robert E. Westerlund, Mequon; Herbert A. Westerlund, and George H. Binsfeld, both of Port Washington, all of Wis., assignors to Construction Forms, Inc., Cedarburg, Wis.

Filed Dec. 21, 1972, Ser. No. 317,199
Int. Cl. B05b *1/20;* **B28c** *7/16*
U.S. Cl. 239—165 **19 Claims**



1. A mobile concrete type distributing apparatus for connection to a separate concrete pump means comprising a movable transport means having a vertical support means, a rotating carriage mounted on said support means, power means for selectively positioning said carriage, a concrete carrying conduit assembly including a first conduit means secured to said carriage and extending outwardly therefrom

and a second conduit means telescoped with the outer end of said first conduit means, a concrete source connecting means for supplying of concrete to said conduit means, and power means for selectively and continuously positioning of said telescoped conduit means in a horizontal plane for the distribution of concrete in an even pattern over a receiving base, said conduit means extending outwardly from the upper end of the support means, an inlet conduit means secured to the lower portion of the support means and extending outwardly in the opposite direction from said first and second conduit means, a transfer conduit means located adjacent the carriage and having a pivot joint, said transfer conduit means connecting said inlet conduit means to said first conduit means, said inlet conduit means providing a counterbalance to said first and second conduit means.

3,860,176

FIRE-FIGHTING BRANCH PIPE NOZZLES

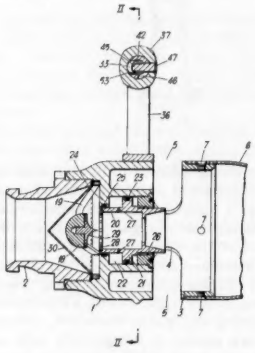
John L. Evans, Sunbury-on-Thames, England, assignor to Chubb Fire Security Limited, Sunbury-on-Thames, Middlesex, England

Filed Apr. 12, 1974, Ser. No. 460,552

Claims priority, application Great Britain, Apr. 12, 1973, 17627/73

Int. Cl. B05b *1/32*

U.S. Cl. 239—456 **11 Claims**



1. In a fire-fighting branch pipe nozzle for discharging fire extinguishing liquid, an improved shut-off valve including a valve member, means moveably mounting said member for movement between closed and open positions, liquid pressure-operated means for moving said valve member between said closed and open positions, means defining a passage leading to said liquid pressure-operated means from upstream of said valve member, a manually operable pilot valve in said passage for controlling the supply of fire extinguishing liquid under pressure to said liquid-pressure operated means, and dash-pot means operative to limit the rate of movement of said valve member from said open position to said closed position under the action of said liquid pressure-operated means.

3,860,177

SOAKER HOSE

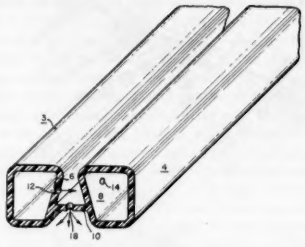
Norman L. Huffaker, 5400 Bewdley Rd., Richmond, Va. 23226

Filed Dec. 18, 1973, Ser. No. 425,883

Int. Cl. B05b *1/20*

U.S. Cl. 239—450 **1 Claim**

1. A soaker device comprising a pair of elongated, spaced, coplanar, tubular elements having four substantially straight, interconnected wall portions, one of said walls in each tubular member being wider than all of the others, said wider walls in the tubular elements facing each other, normally converging in an upward direction, and each said wider wall having inwardly and downwardly directed small openings adapted to impinge a stream of water against the walls of the adjacent wider wall of the opposite tubular element, the openings in the wider wall of each tubular element being staggered with respect to the openings in the the opposite tubular element, and a relatively thin, normally horizontal, solid web member extending between said tubular members interconnecting said wider walls, said web member being significantly spaced from the other walls of said tubular members and located below the openings in said wider walls and having substantially vertical small openings spaced along its length, whereby water through the tubular elements will impinge against the confronting adjacent small elements to fall down onto the web member and thence trickle down to the ground.



3,860,178

FUEL INJECTION NOZZLE

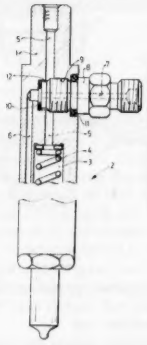
Kurt Seifert, Esslingen-Zollberg, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 21, 1974, Ser. No. 435,165

Claims priority, application Germany, Feb. 7, 1973, 2305766

Int. Cl. B05b *1/30*

U.S. Cl. 239—533 **4 Claims**



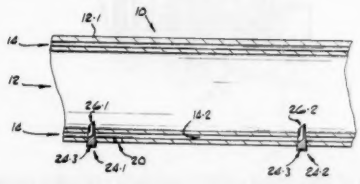
1. In a fuel injection nozzle for internal combustion engines having a nozzle holder, a pressure channel leading in sections to a nozzle pressure chamber, along a spring chamber, and passing eccentrically in the nozzle holder, the pressure channel having a connecting bore passing radially to the longitudinal axis of the nozzle holder, and having a drain channel of the spring chamber which passes in vicinity of a pressure channel connection bore in a longitudinal direction of the nozzle holder, the improvement comprising an intersection between said pressure channel and said drain channel, a pressure socket arranged in said connecting bore for separating said pressure channel and said drain channel, said socket having an end prtion protruding into said nozzle holder axially before

and after said intersection, sealing means provided on each side of said intersection, and recess means having a surface and defining a passage for leak channel transverse flow is provided in the intersection.

3,860,179
DRIP IRRIGATION

Erminio Natale Costa, La Valle, Hugenot, South Africa

Filed Feb. 1, 1972, Ser. No. 222,594
Claims priority, application South Africa, Feb. 17, 1971, 71/1025
Int. Cl. B05b *15/00*
U.S. Cl. 239—542 **11 Claims**

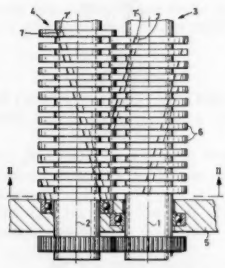


4. A plug for preparing for use a fitting as claimed in claim **1**, the plug having an elongated body portion and being adapted to be inserted through one of the capillary tubes to extend into the flow conduit, the plug having a single passage to place the flow conduit in communication with the tube when the plug is in position in the tube the passage at all positions having a diametrical dimension which is not more than about half the diametrical dimension of the part of the plug along which the passage extends, and the passage having a cross-sectional flow area which is less than that of the capillary tube.

3,860,180
METHOD AND APPARATUS FOR DESTROYING DOCUMENTS

Albert Goldhammer, Zum Hecht 40, 7773 Nussdorf/Uberlingen, Germany

Filed Mar. 14, 1973, Ser. No. 341,294
Claims priority, application Germany, Sept. 29, 1972, 2247901
Int. Cl. B02c *18/06*
U.S. Cl. 241—27 **5 Claims**

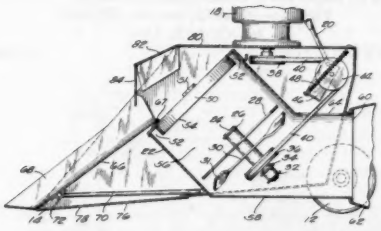


1. The method of destroying a document which comprises: cutting the document into narrow longitudinal strips while simultaneously forming each strip into short sections, the longitudinal strips being formed by making spaced parallel slits in the document, and the longitudinal strips being formed into short sections by making transverse incisions in the document each of which extends obliquely from the path of one slit to the path of an adjacent slit, the incisions pertaining to each strip being formed in the document in longitudinally distributed relation with each incision staggered relative to laterally adjacent incisions, the transverse incisions being formed in the document in advance of the forming of the slits intersected thereby and simultaneously with the forming of the slits.

3,860,181
SHREDDING MACHINE

Edward W. Enters, Fredonia, and Edgar W. Detjen, Kiel, both of Wis., assignors to Gilson Bros. Co., Plymouth, Wis.

Filed Aug. 8, 1973, Ser. No. 386,807
Int. Cl. B02c *13/14*
U.S. Cl. 241—55 **10 Claims**

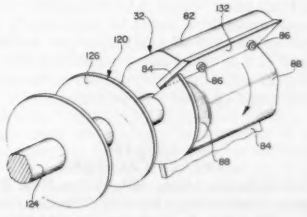


1. A shredding machine comprising a hollow cylindrical shredder drum having an open upper end, an open lower end, an inner surface and an outer surface, a shaft coaxially journalled within said drum, at least one shredding blade attached to said shaft and projecting laterally therefrom, means for rotating said shaft and said shredding blade, an annular inlet spout at the upper end of said drum, coaxial with said drum and projecting downwardly therewithin, said spout having an outer surface, an inner surface and a bottom, there being an annular air space between the outer surface of said inlet spout and the adjacent inner surface of said drum, and the bottom of said inlet spout being spaced above the nearest shredding blade to provide a recirculation zone between the bottom of the spout and said blade for material which is dropped into said inlet spout to be shredded by said shredding blade and discharged through the open lower end of the drum.

3,860,182
AUGER FEED GRANULATOR

Russell Irving Peterson, Seekonk, Mass., assignor to Cumberland Engineering Company, Inc., Pawtucket, R.I.

Filed Nov. 5, 1973, Ser. No. 412,653
Int. Cl. B02c *18/14, 18/22*
U.S. Cl. 241—186 A **9 Claims**



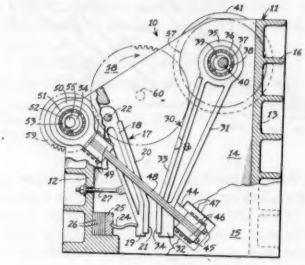
1. Apparatus for comminuting material comprising, a substantially enclosed cutting chamber adapted to receive said material, rotor means positioned within said cutting chamber, means for driving said rotor means, cutting means affixed on said rotor means, bed knife means positioned within said cutting chamber and arranged to make cutting engagement with said cutting means as said rotor means is driven to

thereby comminute the material in said chamber, auger means affixed to said rotor means in axial alignment therewith, enclosure means surrounding at least a portion of said auger means and defining a cavity in which said auger means rotates, a first inlet opening from said cavity to said cutting chamber, and a second inlet opening into said cavity and forming a passage for introduction of said material to said auger means, said auger means being rotatable in response to said rotor means being driven to thereby move material introduced to said auger means toward said cutting chamber.

3,860,183
JAW-TYPE CRUSHER

Nelson H. Bogie, Rt. 1, Gilbertsville, Ky. 42044

Filed Aug. 9, 1973, Ser. No. 387,005
Int. Cl. B02c *1/04*
U.S. Cl. 241—217 **4 Claims**



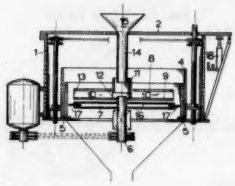
1. A crushing apparatus comprising:
a. a frame having upper and lower end portions and front and rear portions,
b. a first jaw member mounted in said frame and having a first lower crusher surface,
c. a second jaw member within said frame, said second jaw member having an upper end portion and a second lower crusher surface proximately spaced behind and opposing said first crusher surface,
d. first mounting means supporting the upper end portion of said second jaw member on said frame for rotary eccentric motion in a vertical plane,
e. an elongated beam having first and second ends,
f. connecting means fixing the first end of said beam to said second jaw member adjacent said second crusher surface,
g. second mounting means supporting the second end of said beam on said frame, remote from said second crusher surface, for rotary eccentric motion, in a vertical plane parallel to the vertical plane of said second jaw member,
h. said beam being flexible in its longitudinal vertical plane,
i. synchronous drive means for eccentrically rotating the upper end portion of said second jaw member and the second end of said beam for corresponding reciprocal motion of said second jaw member for crushing material between said opposed jaw surfaces.

3,860,184
IMPACT CRUSHERS

Victor Ernest Henry Acton, 304 Mostyn Hall, Princess Pl., Parktown, Johannesburg, Republic of South Africa

Filed Nov. 8, 1972, Ser. No. 304,832
Claims priority, application South Africa, Nov. 9, 1971, 71/7547
Int. Cl. B02c *19/00*
U.S. Cl. 241—275 **7 Claims**

1. An impact crusher comprising: a stationary casing having a geneally upright cylindrical bowl; a rotatable beater assembly located within said bowl, said beater assembly including a plurality of substantially horizontal radially extending elongate blades rotatable about a vertical axis; carrier means pivotally supporting said beater assembly; and a material feed assembly located above said beater assembly and coaxial with the pivotal axis of said beater assembly, said feed assembly including a vertical duct having means at the upper end thereof for infeed of material, a rotatable housing encompassing the lower outlet end of said duct, said housing having a

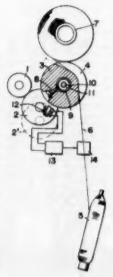


plurality of open-ended radially outwardly extending passages for ejecting material therefrom toward the inner annular surface of said bowl, said feed assembly housing including two spaced radially extending plates and a plurality of radially extending vanes interconnecting said plates and defining said passages therewith, said vanes including a series of transversely extending strips thereon, said strips being spaced apart along the length of each said vane.

3,860,185
ROTATION DETECTOR IN A FIXED LENGTH YARN WINDING APPARATUS

Shozaburo Makino, Kawasaki; Seiji Otobe, Yono, and Shinichi Yamamoto, Tokyo, all of Japan, assignors to Nippon-Seren Co., Ltd., Nakahara-ku, Kawasaki City, Kanagawa Prefecture, Japan

Filed Dec. 28, 1973, Ser. No. 429,282
Int. Cl. B65h *63/00*
U.S. Cl. 242—36 **7 Claims**



1. A rotation detector in a fixed length yarn winding apparatus comprising a drum engaging a bobbin for winding up yarn, a shaft through said drum rotatable therewith, a screw extending in the radial direction into said drum to fix the shaft to said drum and a detecting element adjacent to the peripheral side of said drum, said detecting element sensing the screw and producing signal pulses whenever the head part of said screw passes.

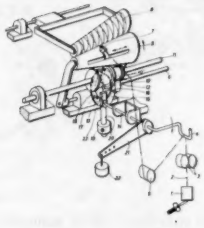
3,860,186
METHOD AND APPARATUS FOR WINDING YARN FROM OPEN END SPINNING DEVICES

Adolf Schiltknecht, and Andre Lattion, both of Winterthur, Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Continuation of Ser. No. 883,011, Dec. 8, 1969, abandoned. This application Sept. 7, 1972, Ser. No. 287,012

Int. Cl. B65h *59/38*

U.S. Cl. 242—45 **14 Claims**



1. An apparatus for winding yarn from an open end spinning device onto a yarn package at constant yarn tension comprising

a winding device including a tiltable yarn package driving drum;

a yarn package contacting said drum in frictional driving relation for winding of a yarn emitted from the open end spinning device thereon;

a rotatable drive roll in the form of a cone;

a yarn tension feeler in the path of the yarn between the open end spinning device and said package;

a friction ring between said drive roll and said drum in shiftable relation axially of said drive roll and said drum for transmitting the circumferential speed of said drive roll prevailing at the position of said ring to said drum; and

means for shifting said ring in response to the tension in the yarn between the open end spinning device and said package, said means including a fork disposed about said ring to shift said ring axially of said drum and drive roll, and a delay mechanism between said feeler and said fork for delaying the transmission of the movement of said feeler to said fork, said delay mechanism including a carrier lever connected to said feeler for activating said fork after a predetermined movement of said feeler.

3,860,187
CIRCUIT FOR CONTROLLING THE THREAD VELOCITY IN WINDING EQUIPMENT WITH A TRAVERSING MECHANISM

Manfred Liska, Nurnberg, and Jurgen Metzger, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munchen, Germany

Filed Apr. 18, 1973, Ser. No. 352,268

Claims priority, application Germany, Apr. 21, 1972, 2219755

Int. Cl. B65h *59/38*

U.S. Cl. 242—45 **5 Claims**

1. A circuit for controlling the thread velocity in a universal winding machine having a traversing mechanism, said machine including a spool drive operated by a speed control, said circuit providing compensation for inaccuracies resulting from said traversing mechanism comprising:

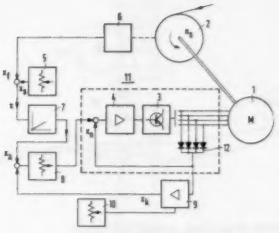
a. means to measure the tangential velocity of the spool and to provide a first output signal proportional thereto;

b. means to provide a second signal representing a desired tangential velocity;

c. means having said first and second signals as inputs to develop a speed control signal;

d. means to develop a third signal proportional to the actual spool drive speed;

e. means to couple said speed control signal and said third signal to said speed control;



f. means to develop from said actual spool drive speed a correction factor signal proportional to the diameter of the winding on the spool; and

g. means to add said correction factor signal to said speed control signal.

3,860,188
STRIP ACCUMULATOR

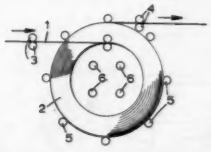
Harry Osborne Bradshaw, Birmingham, England, assignor to Tube Products Limited, Oldbury, Warley, England

Filed Dec. 21, 1972, Ser. No. 317,178

Claims priority, application Great Britain, Dec. 21, 1971, 59446/71

Int. Cl. B65h *17/48*

U.S. Cl. 242—55.21 **11 Claims**

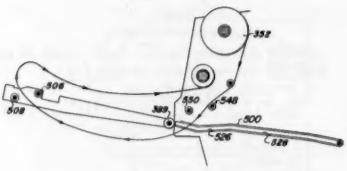


1. A method of feeding strip material to a strip-utilizing machine while providing a variable reserve to allow for intermittent interruptions of the feed-in and withdrawal of the strip while maintaining continuously without interruption the withdrawal and feed-in respectively, comprising forming said strip into a single spiral coil having a fixed number of turns and having its axis vertical, feeding said strip onto the inside of said coil while withdrawing strip from the outside of said coil, defining the maximum and minimum radii which the turns of said coil are allowed to have, the difference between said radii being greater than the radial space occupied by the given number of turns of the coil when those turns are close-packed, and allowing the turns to contract successively, or expand successively, to provide a reserve represented by the difference between the expanded and contracted circumferential lengths of the turns that allows continued withdrawal in the absence of feed-in and continued feed-in in the absence of withdrawal, up to the limit of the number of turns present.

3,860,189
PHOTORECEPTOR LOADING SYSTEM

James R. Cassano, and Frank J. Sanza, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 73,565, Sept. 18, 1970,. This application Sept. 25, 1972, Ser. No. 292,004
Int. Cl. B65h *17/02, 17/22*
U.S. Cl. 242—67.3 14 Claims

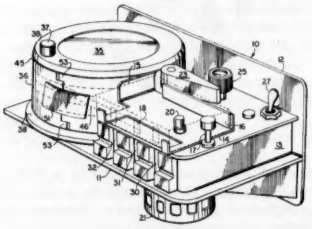


1. A copying machine, comprising:
a photosensitive member in the form of an elongated web supported for movement past an exposure station by a supply reel and a take-up reel;
housing structure including means for supporting the supply and take-up reels and a plurality of guide rolls;
removable support structure insertable into said housing structure and removable therefrom; and
a plurality of guide rolls carried by said removable support structure, said guide rolls carried by said support structure cooperating with said guide rolls supported by said housing structure to guide and support the photosensitive member for movement within said housing structure.

3,860,190
WEB STORAGE APPARATUS

Fred C. Bolick, Jr., Atlanta, Ga., assignor to Lanier Electronic Laboratories, Inc., Atlanta, Ga.

Filed Oct. 29, 1971, Ser. No. 193,860
Int. Cl. B65h *75/00*
U.S. Cl. 242—68.5 12 Claims

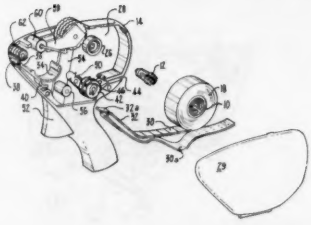


1. Apparatus for receiving a length of a flexible web material, comprising:
web holding means defining a web supporting surface;
said web holding means being normally resiliently operative to assume a first configuration wherein said web holding means is substantially flat and being elastically deformable to assume a second configuration wherein said web holding means is substantially nonflat; and
said web supporting surface has a predetermined length which remains substantially unchanged whether said web holding means assumes said flat or said nonflat configuration.

3,860,191
MARKING GUN TAPE SUPPLY

Don W. Geri, Mountain View, Calif., assignor to Primark Corporation, Union City, Calif.

Filed Sept. 5, 1972, Ser. No. 286,124
Int. Cl. B65h *75/02*
U.S. Cl. 242—68.5 5 Claims

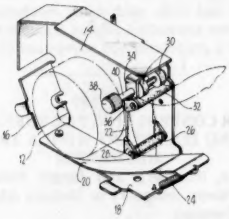


1. An improved core for a roll of adhesive label tape for a tape supply, the core being insertable and rotatable on a spud in a marking gun, said core comprising a cylindrical core having a cylindrical outer support surface for supporting a roll of adhesive label tape and having an axially concentric inner bore with three keyways asymmetrically disposed around the periphery of the bore, the core being adapted to cooperate with the spud mounted in the marking gun, the spud comprising a spindle having a distal end with three projecting tabs coincident with the three keyways in the core when the core is selectively oriented with respect to the spud, coincident orientation occurring only once during a complete revolution of the core with respect to the spud, the tabs collectively forming a flange for retaining the core on the spud once the core is inserted thereon.

3,860,192
TAPE FEED MECHANISM

John Charles Morris, Castro Valley, Calif., assignor to The Singer Company, New York, N.Y.

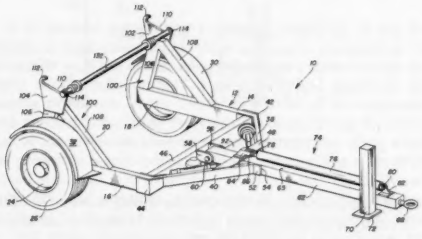
Filed Oct. 9, 1973, Ser. No. 404,538
Int. Cl. B65h *23/06*
U.S. Cl. 242—75.4 6 Claims



1. In a tape printing device,
compartment means for storing a supply roll of tape,
braking plate means at one end of said compartment means, a yieldable ramp inclining upwardly toward said braking plate means for supporting said supply roll of tape in a position to permit said roll to roll up said ramp and engage said braking plate means, and
means for guiding and feeding said tape to a printing and cutting station located on the same end of said compartment as said braking plate means and which when actuated pulls said tape off said supply roll,
the arrangement of said braking plate means, ramp and last mentioned means being such that when the tape is ini-

tially pulled by said guiding and feed means the roll has a tendency to roll up said ramp, to engage said braking plate means with the concurrent operation of gravity tending to roll the supply roll back down said inclined ramp.

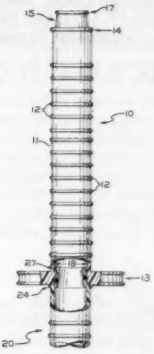
3,860,193
SELF LOADING REEL CARRIER
Lane A. Green, Longview, Tex., assignor to Superior Iron Works & Supply Company, Inc., Shreveport, La.
Filed Sept. 24, 1973, Ser. No. 400,267
Int. Cl. B65h *75/40*
U.S. Cl. 242—86.5 R **11 Claims**



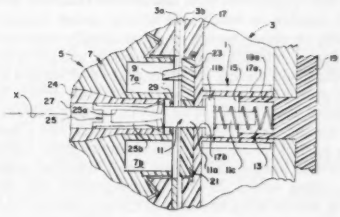
1. A carrier for a spindle mounted reel comprising:
a main frame having two opposite side members and a rear opening for receiving a reel;
wheel assembly means supporting said main frame;
reel spindle supporting means carried on said frame adapted to engage a spindle disposed in the opening;
a longitudinally extending drawbar pivotally connected to said main frame member; and
means for pivoting said main frame relatively to said drawbar whereby said reel supporting means can be selectively rotated between a loading and unloading position and a transporting position, said means for pivoting said main frame comprising a linear hydraulic cylinder pivotally attached to said drawbar and to said main frame at a location on the main frame ahead of the connection between the drawbar and main frame.

3,860,194
BOBBIN FOR TEXTILE FIBERS
Alfred M. Roscher, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed May 21, 1973, Ser. No. 362,575
Int. Cl. B65h *75/12*
U.S. Cl. 242—118.32 **5 Claims**

1. A textile bobbin having a hollow interior comprising a generally cylindrical body, having at the bottom thereof a hub of greater perimeter than the circumference of any cross-section of the cylindrical body taken perpendicular to the axis of said cylindrical body, said cylindrical body having at the apex thereof a flange member of greater cross-sectional diameter than the aperture of the interior of the base of said bobbin, said flange member having a surface at the top thereof disposed perpendicular to the axis of said cylindrical body, said hub and said flange defining the length of the yarn package to be wound on said cylindrical body of said bobbin, said bobbin having an extension at the top of said flange of a configuration wherein the maximum cross-sectional diameter of said extension is 10 to 30 one thousandths of an inch less than the cross-sectional diameter of the interior of the bobbin at a point which, when two of said bobbins are nested with the top of one inside the bottom of the other, the periphery of the extension at the maximum cross-sectional diameter is adjacent to said point, and the bottom of said hub of one bobbin rests on the surface of said flange of the other bobbin, said extension at the top of said flange being of sufficient length to impart vertical stability to the nested bobbins.



3,860,195
DISABLING DEVICE FOR AN ANTI-BACKUP MECHANISM IN A FILM CARTRIDGE
Ronald Charles Holzhauser, Holley, and Gerald Julius Kosarko, Pavilion, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed May 4, 1972, Ser. No. 250,352
Int. Cl. G03b *1/04;* **G11b** *15/32, 23/04*
U.S. Cl. 242—194 **5 Claims**



1. In a motion picture camera having a cartridge chamber adapted to receive a film cartridge of the type having a disengageable anti-backup mechanism, a device for automatically disabling the anti-backup mechanism of the received cartridge when the cartridge is inserted into the cartridge chamber comprising:
a. an elongate pin having a head portion engageable with the anti-backup mechanism of the cartridge when the cartridge is inserted into the cartridge chamber, the pin further comprising a shoulder for limiting extension of the head portion into the chamber;
b. means mounting said elongate pin for movement between (1) a first position wherein said head portion is effective to disable the anti-backup mechanism of the received cartridge and (2) a second position wherein said elongate pin is in a retracted position relative to the cartridge chamber and is thereby ineffective to disable the anti-backup mechanism; and
c. means for urging said elongate pin toward its first position, said urging means comprising a spring engageable with said pin.

3,860,196

APPARATUS FOR INTERCEPTING AND ADVANCING THE LEADER OF CONVOLUTED STRIP MATERIAL

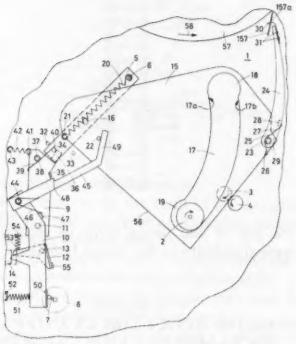
Fritz Krumbein, Stuttgart-Mohringen, Germany, assignor to Robert Bosch Photokino GmbH, Stuttgart, Germany

Filed Oct. 17, 1972, Ser. No. 300,416

Claims priority, application Germany, Oct. 23, 1971, 2152896

Int. Cl. G03b *1/58, 1/04*

U.S. Cl. 242—195 **14 Claims**



1. Apparatus for intercepting the leader of a supply of convoluted strip-shaped material wherein the leader constitutes the free end portion of the outermost convolution of said supply, comprising driving means; an intercepting device having first and second motion receiving means and being movable seriatim from a first position in which said driving means is disengaged from both said motion receiving means to a second position in which said driving means engages said first motion receiving means to automatically move said device to a leader-intercepting third position, and a fourth position in which said driving means engages said second motion receiving means to automatically return said device to said first position, said intercepting device further comprising a holder, a catcher arm provided on said holder, and a material-engaging portion provided on said catcher arm; supporting means for said holder, said holder being turnable relative to said supporting means about a predetermined axis and said supporting means being movable in a plane disposed substantially at right angles to said axis; actuating means operable to move said intercepting device from said first to said second position whereby said device automatically advances to said third position to intercept said leader; and means for moving said intercepting device from said third to said fourth position with the intercepted leader whereby said device automatically returns to said first position.

3,860,197

MOTOR-DRIVEN FILM REWIND DEVICE FOR A CAMERA

Shiro Sugimori, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed July 24, 1972, Ser. No. 274,649

Claims priority, application Japan, Aug. 9, 1971, 46-60074

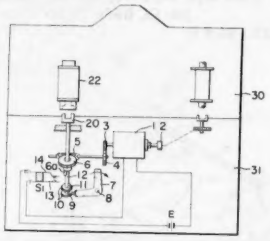
Int. Cl. B11b *15/32;* **G03b** *1/04*

U.S. Cl. 242—201 **4 Claims**

1. In a camera adapted to receive a film supply spool, an opening formed in the body of the camera and a motor-driven film rewind device detachably attached to the camera body, said motor-driven film rewind device comprising

1. a motor;
2. a circuit for driving said motor including a switch for opening and closing said circuit;
3. a rotary shaft slidable axially thereof between first and second positions,

said rotary shaft having, at one end thereof, coupling means engageable with the supply spool through said opening in the camera body when said motor-driven film rewind device is attached to the camera body and said rotary shaft is in its second position,



said switch being responsive to the sliding movement of the rotary shaft and opened and closed in the first and second positions of the rotary shaft, respectively; and

4. transmission means connected between the rotary shaft and the motor for transmitting the drive from the motor to the shaft to rotate same, whereby, when the rotary shaft is brought into its second position, the supply spool is rotated by the motor through the transmission means and the rotary shaft to rewind the film on the spool.

3,860,198

TAKE-UP DRIVE FOR CINEMATOGRAPHIC APPARATUS

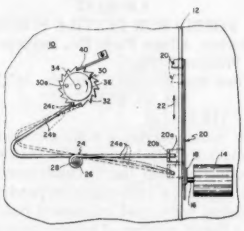
Heinz Peschel, Stuttgart, and Manfred Radtke, Korb, both of Germany, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 16, 1973, Ser. No. 342,006

Claims priority, application Germany, May 30, 1972, 2226204

Int. Cl. G03b *1/06*

U.S. Cl. 242—205 **6 Claims**



4. Apparatus for winding a received film strip into a roll as the film strip is intermittently advanced by film advancing means, said apparatus comprising:

a. winding means including a ratchet portion adapted to rotatably drive said winding means; and

b. a spring member having first and second legs, said first leg coupled to said film advancing means and said second leg cooperating directly with said ratchet portion to rotatably drive said winding means as the film advancing means intermittently advances the film strip.

3,860,199
LASER-GUIDED PROJECTILE SYSTEM

Brian B. Dunne, La Jolla, Calif., assignor to Ship Systems, Inc., San Diego, Calif.

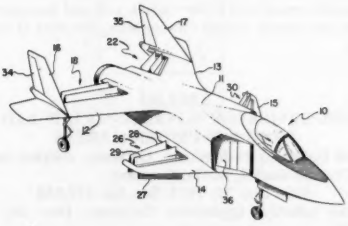
Continuation-in-part of Ser. No. 214,619, Jan. 3, 1972, abandoned. This application Dec. 17, 1973, Ser. No. 424,936
Int. Cl. F42b *15/10, 15/02, 15/00*
U.S. Cl. 244—3.13 **20 Claims**

1. A method for guiding a spinning projectile or the like having at least one discrete mass releasably mounted in the projectile with the center of gravity of said mass located in a plane substantially normal to the axis of the projectile and passing proximate to the center of gravity of the projectile, said method comprising the steps of; determining the deviation of the projectile from an optimum trajectory along which the projectile would impact a target, transmitting a predetermined signal to said projectile, receiving said signal by said projectile, and releasing at least one of said masses from said projectile in response to receipt of said predetermined signal by said projectile in a manner to impart a correctional momentum to said projectile sufficient to translate said projectile toward said optimum trajectory.

3,860,200
AIRFOIL

Edward M. Petrushka, Westerville, Ohio, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Sept. 5, 1973, Ser. No. 394,581
Int. Cl. B64c *3/38*
U.S. Cl. 244—42 CC **4 Claims**

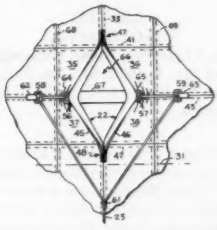


1. Airfoil means for an aircraft system, comprising:
an airfoil structure having an aerodynamic cross-sectional surface profile producing aerodynamic lift at a predetermined magnitude correlated to an aircraft system attitude-stabilized cruise flight condition;
first airfoil-like primary fluid flow injector means supported by said airfoil structure for rotation throughout an angular range extending from a contained first position defining said airfoil cross-sectional surface profile in part to a projected second position in part defining operating lift ejector throat and diffuser sections producing fluid-reaction lift in an aircraft system non-cruise flight condition;
second airfoil-like primary fluid flow injector means supported by said airfoil structure for rotation independently of said first airfoil-like primary fluid flow injector means and throughout an angular range substantially greater than said first injector means angular range; and
actuator means connected to said second injector means and selectively operable to rotate said second injector means to a projected first position whereat the trailing edge of said second injector means is positioned above the trailing edge of said airfoil structure profile at said predetermined magnitude of aerodynamic lift to substantially reduced the camber of said airfoil cross-sectional profile and thereby reduce said airfoil structure aerodynamic lift to less than said predetermined magnitude and to a projected second position whereat the trailing edge of said second ejector means is positioned below the trailing edge of said airfoil structure profile at said predetermined magnitude of aerodynamic lift and in part defines the lift ejector throat and diffuser sections partially defined by said first injector means, and also to an intermediate contained position whereat said second injector means in part comprises said airfoil structure cross-sectional surface profile producing aerodynamic lift at said airfoil structure aerodynamic lift predetermined magnitude.

3,860,201
HOT AIR BALLOON MANEUVERING VALVE

Ralph H. Hall, 1656 Massachusetts Ave., Lexington, Mass. 52173

Filed Mar. 14, 1973, Ser. No. 341,093
Int. Cl. B64b *1/62*
U.S. Cl. 244—99 **14 Claims**



1. In a hot air balloon including a balloon envelope of light weight material and load carrying means at the lower end of the balloon, a buoyancy life control, including a slit in the envelope material, the slit having substantially straight edges which are substantially together when the slit is closed and separated when the slit is opened, comprising,
a flap on each side of the slit extending the length thereof on the inside of the balloon envelope,
the flaps being substantially contiguous to each other when the slit is closed
each flap being a piece of flexible sheet of length and width, each flap extending from the slit inwardly toward the center of the balloon envelope, and
each flap being of substantial width at at least the portion thereof central between the ends of the slit in order that a substantial area of the flaps are contiguous when the slit is closed and gas discharging through the slit from inside the balloon tends to force the flaps together, and
means for spreading the slit and holding the flaps open for the escape of the air from the balloon envelope.

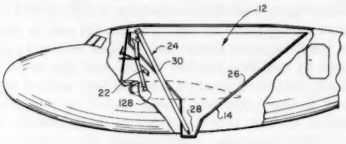
3,860,202
METHOD AND APPARATUS FOR DISPENSING GRANULAR MATERIAL FROM AIRCRAFT

Ralph S. Johnson, 907 Frontier Park Ave., Cheyenne, Wyo. 82001

Filed Sept. 5, 1972, Ser. No. 286,114
Int. Cl. B64d *1/18*
U.S. Cl. 244—136 **15 Claims**

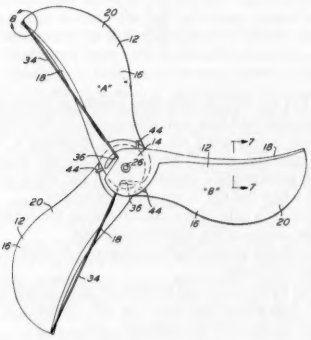
1. In an aerial dispensing apparatus for aircraft, a feed mechanism for transferring granular material and the like from a storage bin to outlet dispensing means, said feed mech-

anism comprising feed bin means, conveyor means for positively removing granular material at a controlled rate from said storage bin, said conveyor means including upwardly from a lower portion of the storage bin and terminating in spaced relationship above the feed bin means to discharge material by gravity into said feed bin means, said conveyor means including an outer housing enclosing said conveyor



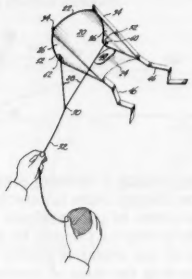
means within said storage bin, an inlet at the lower end of said housing and an outlet spaced above said feed bin means, feed bin means disposed to receive and store the granular material discharged by said conveyor means, and adjustable control means between said feed bin means and said outlet dispensing means to regulate the flow of granular material from said feed bin means into said outlet dispensing means.

3,860,203
WINGED DEVICE
Thomas A. Hyde, 7 University Mews, Philadelphia, Pa. 19104
Filed Jan. 5, 1972, Ser. No. 215,596
Int. Cl. B64d *19/02;* **A63h** *27/00*
U.S. Cl. 244—138 A **8 Claims**



1. A winged rotating device comprising two wings, each of said wings comprising a hub portion and an air foil portion, a shaft defining an axis of rotation for said wings and for said rotating device, an aperture in each of said hub portions for receiving said shaft, at least one of said wings being rotatable about said shaft into substantial congruence with the other of said wings, means for displacing said wings from said substantial congruence, self-releasing means for temporarily retaining said wings in said substantial congruence against the force of said displacing means, said self-releasing means comprising a pin projecting from each of said wings, said pins being in mutual alignment when said wings are in substantial congruence and an elongated resilient member adapted to be wrapped around said pins, said displacing means being operative to position said wings at substantially equal angular intervals about said shaft so that said wings support said device for rotation about said axis of rotation as said device descends.

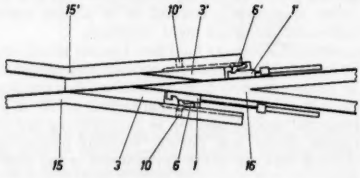
3,860,204
SELF-STIFFENED FLEXIBLE KITE
David M. Checkley, P. O. Box 9081, Seattle, Wash. 98119
Filed May 11, 1973, Ser. No. 359,312
Int. Cl. B64c *31/06*
U.S. Cl. 244—153 R **10 Claims**



1. In a kite of the type wherein an air-foil panel providing a leading edge and a trailing edge, includes a tether panel oustanding contiguous to each side edge of said air-foil panel between said leading and trailing edges and there is a means for bracing said air-foil panel against longitudinal flexure, and said tether panels by tether lines are joined to a flight line, the improvement, wherein:

said means for longitudinally bracing said air-foil panel comprises a flange normally weak under longitudinally applied compressive forces rear-standing substantially perpendicular to each line of contiguity and extending the full length of said air-foil panel and the tether panels associated therewith, said flange being uninterrupted throughout its full length and width, and said flanges, during flight of said kite, being stiffened by tensile forces applied thereto at the lines of contiguity by the air distendair-foil panel and tether panels, and said flanges stiffening said panels against bowing along the lines of contiguity.

3,860,205
CLOSING DEVICE FOR MOVABLE PARTS IN RAILWAY FROG AND CROSSING AREAS
Ruthard Dohse, Essen-Bredeney, Germany, assignor to Elektro-Thermit GmbH, Berlin, Germany
Filed Dec. 29, 1972, Ser. No. 319,538
Claims priority, application Germany, Dec. 28, 1971, 2164924
Int. Cl. E01b *7/10*
U.S. Cl. 246—468 **4 Claims**



1. A closing device for movable parts suitable for closing inner edge gaps within the frog and deflection areas of switch points or crossings, comprising wedge means positioned between a frog point and wing rail,

clamp means rotatably secured at one end thereof to said wedge means,

fishtail-shaped prong end means at the other end of said clamp means,

inclined bearing surface means between said frong point and wing rail and having a recess therein in which the lower prong of said fishtail-shaped prong end means is adpapted to be received,

and slide rod means displaceable along said wedge means and having hook means thereon adapted to engage with the upper prong of said fishtail-shaped prong end means, whereby during movement of said slide rod means in the direction toward said upper prong, the clamp means will be engaged and carried along.

3,860,206

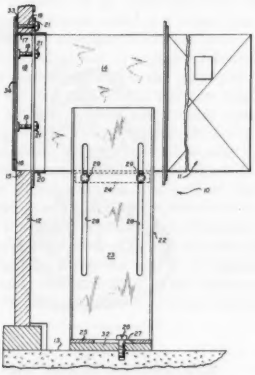
SUPPORT STRUCTURE FOR THROUGH-WALL INSTALLATION OF PACKAGE UNIT

Norman B. Wenig, Scarsdale, N.Y., assignor to Embassy Industries, Inc., Farmingdale, N.Y.

Filed Feb. 5, 1973, Ser. No. 329,739

Int. Cl. F16m *11/04, 1/00*

U.S. Cl. 248—13 **5 Claims**



1. A support structure for a package unit which comprises sleeve means disposed to extend through a wall opening to receive a package unit for presentation through said opening, and adjustable load bearing means positioned to engage said sleeve means to support same and to transfer at least a major portion of the weight of the package unit to an underlying base means to reduce the load applied to the wall, said adjustable load bearing means including a pair of spaced-apart uprights and a transversely extending member adjustably connected to said uprights and positioned to supportingly engage said sleeve means, said sleeve means having a guide flange adapted to bear against one side of the wall on the area thereof adjacent said opening to establish said sleeve means in a given positional relation to the wallopening; and a frame adapted to bear against the opposite side of the wall on the area thereof adjacent said opening, said frame being connected to said flange to secure said sleeve means in said positional relation.

3,860,207

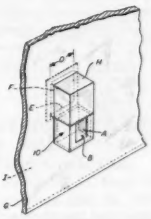
ARTICLE FOR CARRYING AND CONCEALABLY SUPPORTING A CONTAINER

Leo A. Guthart, Old Westbury, N.Y., assignor to Alarm Device Manufacturing Company, Syosset, Long Island, N.Y.

Filed Feb. 28, 1973, Ser. No. 336,551

Int. Cl. F16m *13/00;* **B05d** *85/20;* **H02j** *7/00*

U.S. Cl. 248—27 **1 Claim**



1. A station assembly for concealably mounting a station of two-part electronic assembly members on the lower edge of an apertured portion of a wall inwardly of said wall, said apertured portion being of lesser dimensions than the dimensions of the station assembly, said station assembly comprising:

a. a first assembly member adapted to support electronic components comprising, a housing having means extending from the upper edge thereof for suspending engagement with the lower edge of the apertured portion of the wall, inwardly of said wall and substantially in line with said lower edge, to be connected to the electronic components in a second assembly member for connection with the components of the first assembly member, on assembly of said members;

b. said suspending means on the first assembly member comprising a connecting ledge support portion extending from and parallel to the top of the first assembly member and being of less width than the width of the lower edge of the apertured wall portion;

c. a retaining lip portion angularly extending from the connecting portion for registration with the wall immediately adjacent the said lower edge of the apertured portion of the wall, to secure the first assembly member in registered position against the inner side of said wall inwardly of the wall, with the top of the first assembly member aligned with said lower edge of the apertured portion; and

d. means on said housing for supporting a second assembly member on the upper edge thereof, and

e. a said second assembly member, adapted to support electronic components and proportioned to be insertable through said aperture of the wall, supported on the supporting means on the upper edge of said first member assembly, said second assembly member being disposed in alignment with the aperture in said wall, whereby a station assembly of the two electronic support members with complementary electronic circuitry may be positioned inwardly of and behind the wall, through the aperture therein of substantially smaller dimensions than the dimensions of the station assmebly.

3,860,208
CONSTANT TENSION PIPE SUPPORTS

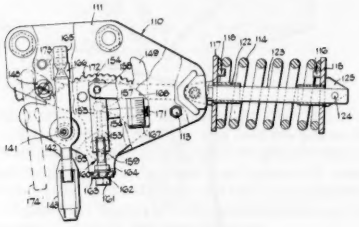
Anthony John Salter, Worcestershire, England, assignor to Pipe Supports Limited, Tividale, Warley, England

Continuation-in-part of Ser. No. 217,463, Jan. 13, 1972, abandoned. This application Feb. 8, 1973, Ser. No. 330,633

Claims priority, application Great Britain, Mar. 16, 1972, 012215/72; Mar. 17, 1972, 012785/72; May 18, 1972, 023401/72

Int. Cl. F16l *3/00*

U.S. Cl. 248—54 CS **3 Claims**



1. A constant-tension pipe support including a fixed part; a lever comprising two spaced lever plates mounted on said fixed part for movement about a pivot axis, the lever having connector means for the load to be supported; spring means carried by the fixed part; a draw bar interconnecting the spring means with the lever; and adjustment means carried by the lever for varying the effective lever arm of the spring means about the pivot axis, said adjustment means including an elongated shaft, a pivotal connection between the shaft and the draw bar, complementary guide means on the shaft and the lever and comprising blocks received in aligned slots or recesses both in the shaft and in the lever plates, the blocks being secured in the slots or recesses in one of the lever plates and the shaft and being slidable in the slots or recesses in the other of the lever plates and the shaft, each block and each recess or slot in said other of the lever plates and shaft having two oppositely-directed planar guide surfaces which lie parallel to the longitudinal axis of the shaft and parallel to said pivot axis, each guide surface on the block being in engagement with a guide surface in one of said recesses or slots in said other of the lever plates and shaft to form a pair of engaged, relatively slidable, guide surfaces, the guide surfaces of each such pair being oppositely directed thus to prevent movement of the shaft transverse to its longitudinal axis, and screw means, including an adjustment element, operatively connected with the shaft for effecting longitudinal movement of the latter in response to operation of the adjustment element thus to vary the spacing between the pivot axis and the pivotal connection between the shaft and the draw bar and hence to vary the lever arm of the spring means.

3,860,209
DECK SOCKET ASSEMBLY

William V. Strecker, West Islip, L. I., N.Y., assignor to Peck & Hale, Inc., West Sayville, L. I., N.Y.

Continuation-in-part of Ser. No. 180,433, Sept. 14, 1971, abandoned. This application Aug. 28, 1972, Ser. No. 284,049

Int. Cl. B60p *7/10*

U.S. Cl. 248—119 R **15 Claims**

1. A socket and an attachment fitting assembly for securing a member such as cargo to a support, the support having a substantially flat upper surface, the combination which comprises:

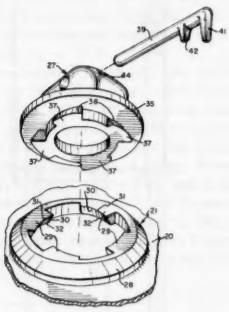
a. a socket member adapted to be secured to said support including a body member having an upper surface generally parallel to the upper surface of the support;

b. a generally arcuate peripheral flange projecting upwardly from the body member;

c. at least two arcuate lugs projecting inwardly from said flange and positioned in spaced relationship along the periphery thereof, each of said lugs having an arcuate edge and a frusto-conical surface extending outwardly and downwardly at a generally acute angle to the upper surface of the body member to define a lower arcuate edge at the intersection therewith, said lower edge being spaced from the center of said flange a greater radial distance than the upper edge, said frusto-conical surface of each lug being generated about a central conical axis spaced radially from the center of the socket member a distance substantially equal to the radial spacing of a central conical axis associated with any other lug;

d. an attachment fitting adapted for rotatable attachment to the socket member and having a body member having a lower surface portion substantially parallel to the body member of said socket member when the attachment fitting is positioned in face-to-face relation with the socket member; and

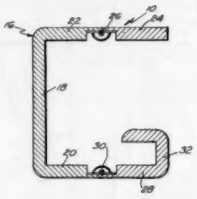
e. at least two arcuate lugs extending downwardly from said body member, said lugs corresponding at least in thickness, spacing and configuration with the lugs of said socket member, each lug having a lower arcuate edge and frusto-conical surface substantially identical to the frusto-conical surface of the mating lug of the socket member and being generated about a conical axis substantially identical to the axis of the mating lug, said surface extending from the lower edge upwardly and inwardly at a generally acute angle to the lower surface of the body member to define an upper arcuate edge at the intersection therewith, and being correspondingly configured and positioned such that when the attachment fitting is placed in face-to-face relation with said socket member in one of a plurality of relative positions, the lugs on the attachment fitting are positioned between the lugs of said socket member and said attachment fitting is rotatable to a second position in which the members become interlocked and the frusto-conical surface of each lug of the attachment fitting is in face-to-face relation with the frusto-conical surface of the mating lug of the socket member thereby providing axial locking between the members due to the interlocking surface-to-surface engagement of the correspondingly positioned lugs of each member.



3,860,210
HANDBAG HOLDER

John D. Berardinelli, 57 Eldridge St., Cranston, and Paul R. Goulart, Johnston, both of R.I., assignors to said Berardinelli, by said Goulart

Filed Aug. 13, 1973, Ser. No. 388,120
Int. Cl. A47f 5/00
U.S. Cl. 248—308 3 Claims

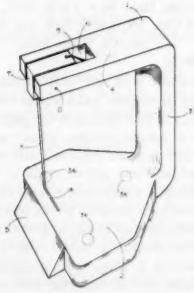


1. A portable holder for suspending a handbag from a horizontal surface, comprising a clamp member formed in substantially a C-configuration defined by a central portion to which opposed end portions are joined at right angles thereto, a surface engaging arm pivotally connected to one end portion and being normally located in a closed position relative to said clamp member, wherein it is parallel to said central portion and perpendicular to the end portion to which it is joined, and being pivotally movable to an open position, wherein it is parallel to the end portion to which it is joined and is disposed in substantially aligned contiguous relation therewith for location on said horizontal surface in engaging relation, and a bag support element pivotally joined to the other end portion and being normally located in a closed position relative to said clamp member wherein it is parallel to said central portion and perpendicular to the end portion to which it is joined, the arm and support element being folded inwardly toward each other in the closed position and cooperating with the clamp member to form a compact unit, said support element being pivotally movable to an open position wherein it is parallel to the end portion to which it is joined and is disposed in substantially aligned contiguous relation therewith for location below the horizontal surface when the arm is in engagement with said surface so as to receive a strap of the handbag thereover for suspending the handbag from said horizontal surface.

3,860,211
DOCUMENT RESTRAINER

Billy Gale Webb, 1421 Daytona, Corpus Christi, Tex. 78415

Filed June 14, 1973, Ser. No. 370,031
Int. Cl. B43m 9/00
U.S. Cl. 248—504 6 Claims

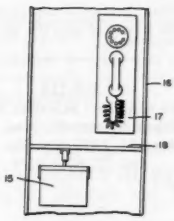


1. A device for restraining the pages of documents comprising in operative association an upright member disposed at the edge of a flat base and projecting upward therefrom, said upright member having a horizontal arm disposed at its upper end and extending away from said member across about the center of said base and parallel thereto; a downwardly projecting elongated member havning an upper L-shaped portion pivot means pivotally attaching said downwardly projecting member near the terminus of said horizontal arm such that said L-shaped portion extends rearwardly toward the upright member and beyond the point of pivotal attachment and so that the downwardly projecting member swings in the plane of said arm and upright member and extends to the vicinity of the base; said downwardly projecting member being partially restrained in its swinging movement and returned to an approximately vertical position by elastic tension means attached at one end to the underside of said horizontal arm and passing over the top of the L-shaped portion of the downwardly projecting member rearwardly of said pivot means and attached at the other end to said downwardly projecting member.

3,860,212
TELEPHONE BOOK HOLDER

Rollie B. Nawman, Oakland, Calif., assignor to Benner-Nawman, Inc., Walnut Creek, Calif.

Division of Ser. No. 290,134, Sept. 18, 1972, Pat. No. 3,791,677. This application Jan. 14, 1974, Ser. No. 432,866
Int. Cl. B42d 17/00
U.S. Cl. 248—447 9 Claims



1. A container for storing and displaying reference material, comprising a spine member, a pair of opposed fixed hinge members extending the length of said spine member, a pair of opposed cover members, each of said cover members including a movable hinge member joined thereto and pivotally secured to one of said fixed hinge members, each of said fixed hinge members including first and second arcuate members extending linearly the length of said spine member, and a first web portion joining said first and second arcuate members.

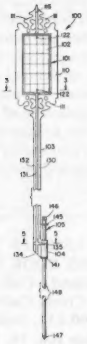
3,860,213
ONE-PIECE SUPPORT

Sidney A. Heenan, Park Ridge, Ill., assignor to Amerace Esna Corporation, Union, N.J.

Continuation of Ser. No. 9,188, Feb. 6, 1970, abandoned. This application Feb. 10, 1972, Ser. No. 225,142
Int. Cl. F16m 13/00
U.S. Cl. 248—466 2 Claims

1. A roadside marker comprising a one-piece support, said support being integrally formed of plastic and including a post and reflector mounting means on one end of said post and spike holding means on the other end of said post, said holding means having a bore extending therethrough and a plurality of flat distributed about the interior surface of said bore and integral therewith, and a spike passing through said bore for driving into the ground and having an exterior surface, said flats being constructed and arranged to provide the bore with

an effective diameter slightly less than the diameter of said spike to cause said holding means frictionally to engage said



spike and to maintain frictional engagement as said spike is driven through said bore and into the ground.

3,860,214

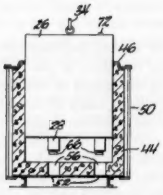
APPARATUS FOR MAKING MANHOLES OF CONCRETE

Hertzell H. Schmidgall, Mediapolis, Iowa 52637

Filed May 21, 1973, Ser. No. 362,367

Int. Cl. B22c *9/24*

U.S. Cl. 249—144 **7 Claims**



1. Apparatus for the manufacture of concrete manhole bases and the like, comprising a jacket having a peripheral wall adapted to be supported in an upright position, a horizontal pallet tolerably fitting within the jacket and supported adjacent to the bottom of the jacket and having an opening therein, a core loosely received within the jacket and having a bottom and an upright peripheral wall and located within the jacket so as to afford a peripheral space between the core and jacket walls, hollow spacer means fixed to and depending from the core bottom into the pallet opening and disposed between the core bottom and pallet and spacing said core bottom above the pallet to afford a bottom space in communication with the peripheral space, and releasable extending means from the interior of the core and through the spacer means and pallet opening and engaging the pallet for releasably locking the core to the pallet.

3,860,215

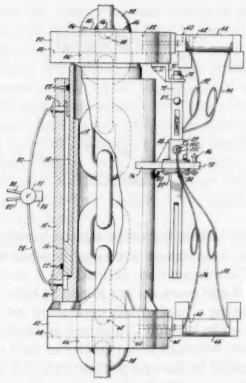
CHAIN JACK

Henry B. Chambers, Santa Inez, Calif., assignor to Hydranautics, Goleta, Calif.

Filed Dec. 4, 1972, Ser. No. 312,024

Int. Cl. B66f *1/00*

U.S. Cl. 254—110 **7 Claims**



1. A chain jack comprising a chain, and a base having a ram and a hydraulic cylinder for imparting reciprocal relative movement between said base and the head of said ram, latches movably attached to said base and to the head of said ram, means for moving said latches in and out of engagement with said chain between links thereof, and means for synchronizing movement of said latches with said reciprocal relative movement between said base and said head of said ram to cause progressive relative movement between said chain and said base; in which the improvement comprises:

a. a side arm attached to said head of said ram;

b. a fixed member attached to said base;

c. one of said side arm and said fixed member provided with a pair of cams;

d. a pair of followers engagable with said cams mounted on the other of said side arm and said fixed member;

e. said followers being connected to hydraulic means for moving said latches in and out of engagement with said chain at predetermined relative positions of said side arm and said fixed member.

3,860,216

AUTOMOBILE WITH SELF CONTAINED JACKS

George E. Brown, Brighton, Ala., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

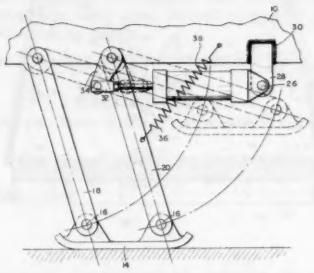
Filed Oct. 19, 1973, Ser. No. 408,117

Int. Cl. B60s *9/02*

U.S. Cl. 254—86 H **1 Claim**

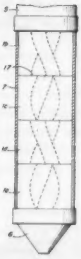
1. In combination with an automobile or other vehicle having a plurality of wheels, each wheel being rotatable about a horizontal axle, a like plurality of jacks, each jack being associated with a corresponding wheel and axle, each jack including first and second parallel inclined elongated rods pivotally secured at their upper ends to the corresponding axle, said rods lying in essentially the same plane as said axle, a support shoe pivotally secured to the lower ends of both rods and essentially parallel to the corresponding axle, a horizontal hydraulic cylinder disposed below the corresponding axle, said cylinder having a front end pivotally secured to said corresponding axle and a rear end with a horizontal axially disposed shaft movable into and out of the cylinder, one end of the shaft always being exposed, a linkage pivotally secured at one end to the free end of the shaft and pivotally secured at the other end to the upper end of the nearest one of the two

rods, and means controllable from the vehicle to provide hydraulic control for said cylinder, said means placing the jack in either one of extended or withdrawn positions, said shoe



engaging the ground to hold the axle in proper position when the jack is in extended position and being held above ground level adjacent the axle when the jack is in withdrawn position.

3,860,217
SHEAR MIXER
Kenneth M. Grout, Topsfield, Mass., assignor to Kenics Corporation, Danvers, Mass.
Filed Apr. 26, 1973, Ser. No. 354,688
Int. Cl. B01f *5/00*
U.S. Cl. 259—4 **10 Claims**

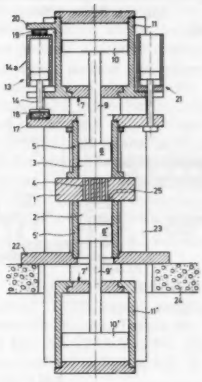


2. A mixer element according to claim **1** in which at least one end face of said body is concave at the end of each of said channels.

3,860,218
TREATMENT APPARATUS FOR COMPOSITIONS OF MATTER
Hans P. Hurlimann, Hornlistrasse 60, Pfaffikon, Switzerland
Filed Feb. 13, 1973, Ser. No. 332,148
Claims priority, application Switzerland, Feb. 18, 1972, 2386/72
Int. Cl. B01f *5/12*
U.S. Cl. 259—98 **19 Claims**

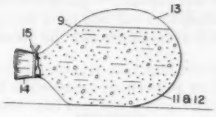
1. Apparatus for treatment of composition of matter, particularly for mixing of macro molecular substances comprising: a pair of opposed pressure cylinders (**5, 5'**), operating pistons (**8, 8'**) therein and means (**10, 11; 10', 11'**) moving the pistons in their cylinders;

a nozzle block (**1; 40; 51, 52**) located between the cylinders and being formed with at least one duct (**4; 41; 54**) of non-circular cross section establishing communication between said cylinders and to permit the composition of matter to be moved from one cylinder into the other, through the duct, upon movement of the pistons, to effect treatment of the composition of matter;



and quick-release pressure means comprising fluid cylinder and piston means (**13, 13', 21**) engaging at least one of said pressure cylinders to press said cylinders towards each other and releasably clamp the nozzle block between the pressure cylinders.

3,860,219
PROCESS FOR MANUALLY MIXING CEMENT
Bryan W. Nickerson, Jr., 200 Lore Ave., Wilmington, Del. 19809
Filed Nov. 20, 1969, Ser. No. 878,467
Int. Cl. B28c *3/00*
U.S. Cl. 259—146 **1 Claim**



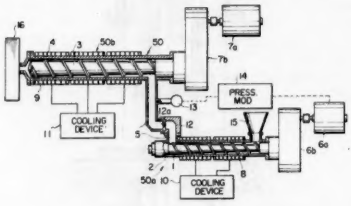
1. A process for manually mixing cement and a liquid by converting a pliable bag into a means for mixing said cement and liquid, comprising the steps of: placing a pliable bag on a surface, fractionally filling said bag with the proper ratio of cement and liquid, closing said bag and trapping air within to a degree that the volume of air trapped therein is greater than that which said bag would hold if it were unaffected by said air trapped therein whereby said unaffected bag will remain in its natural preformed state subject to collapsing in the air portion thereof; the trapping of said air serving to concavely deform said bag from within and support said bag from within in an uncollapsible manner, said deformity characterized as an elipsoid having concave sides when viewed from within and when said bag is filled with the cement, liquid and air, subjecting said bag to manual manipulation characterized as moving said bag about an axis parallel with the surface on which it rests thereby mixing said cement and said liquid.

3,860,220

MULTI-SECTION SCREW EXTRUDER

Saburo Matsubayashi, Aichi-ken, and Kaoru Takano, Nagoya, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 29, 1973, Ser. No. 327,482
Claims priority, application Japan, Jan. 28, 1972, 47-10309
Int. Cl. B29b *1/04*
U.S. Cl. 259—192 **11 Claims**



1. A large capacity screw extruder for non-expandable resins, comprising a first extruder section including a first extruder cylinder of relatively small diameter having an inlet adjacent one end and a discharge adjacent the opposite end, a first extruder screw rotatable in said first extruder cylinder at a relatively high rate of speed for melting the resin material an moving the material from the inlet to the discharge, a second extruder section having a second extruder cylinder of relatively large diameter and having an inlet adjacent one end and a discharge adjacent the opposite end, a second extruder screw rotatable in said second extruder cylinder at a relatively low rate of speed to permit retention of the resin material in said second extruder cylinder and slower movement thereof from said inlet to said discharge, and drive means connected to said first extruder screw and said second extruder screw for driving said first and second extruder screws at distinct speeds with said first extruder screw being rotatable at at least twice the speed of said second extruder screw, a connection between the discharge of said first extruder cylinder and the inlet of said second extruder cylinder for delivering the material advanced through said first extruder cylinder to said second extruder cylinder and pressure responsive sensing means connected to said connection and said drive means for regulating said drive means in accordance with the pressure in said connection.

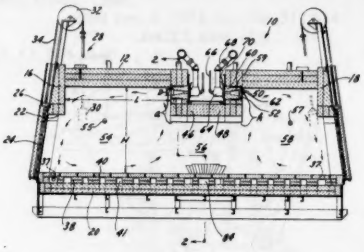
3,860,221

DIRECT FIRED FURNACE

Klaus H. Hemsath; Harry Dean Schmidt, both of Sylvania, and Arvind C. Thekdi, Toledo, all of Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed May 2, 1973, Ser. No. 356,402
Int. Cl. C21d *1/08*
U.S. Cl. 266—5 **7 Claims**

4. A longitudinally extending furnace comprising a housing having a roof, floor, sidewalls and end walls, opening means for charging work through one end wall, opening means for discharging work from the other end wall, means for conveying work from the charge end of the furnace to the discharge end, wall means located intermediate said end walls to divide said furnace into two confluent treating chambers, direct fired burner means located within each chamber and including at least one direct fired burner having an annular housing defining a combustion chamber located at each chamber end adjacent said wall means and being directed to fire towards its respective end wall, gas passageway means confluent with each of said treating chambers, flue means confluent with said passageway means and the ratio of a furnace treating chamber



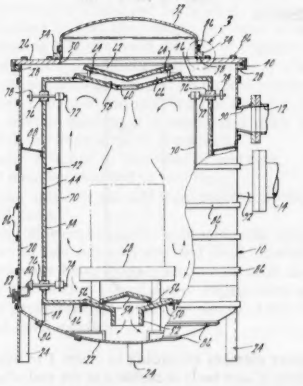
length to the diameter of a burner ranging between 20:1 to 80:1.

3,860,222

COOLING SYSTEM FOR VACUUM FURNACES

Clifford C. Tennenhouse, Troy, Mich., assignor to Wall Colmonoy Corporation, Detroit, Mich.

Filed Nov. 2, 1973, Ser. No. 412,481
Int. Cl. C21d *1/06*
U.S. Cl. 266—5 C **8 Claims**



1. A vacuum furnace comprising a structural enclosure defining a three dimensional chamber, an insulating liner in said enclosure and disposed in spaced relationship from the inner surfaces thereof dividing said chamber into an outer zone and an inner work zone, a support in said work zone for supporting work to be thermally processed, heating means for heating said work zone, removable closure means sealingly disposed on said enclosure for gaining access to said chamber, an inlet port in said enclosure for introducing a cooling fluid into said outer zone, an outlet port in said enclosure for withdrawing the cooling fluid from said outer zone, a baffle disposed between the interior surface of said enclosure and the exterior surface of said insulating liner for dividing said outer zone into an inlet zone disposed in communication with said inlet port and an outlet zone disposed in communication with said outlet port, said insulating liner including a removable section for gaining access to said work zone, nozzle means in said liner for directing cooling fluid from said inlet zone into said work zone and in cooling relationship with respect to any work on said support therein, discharge means in said liner for

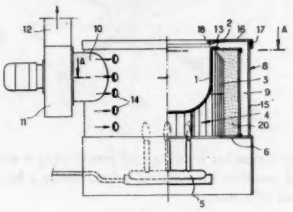
discharging cooling fluid from said work zone into said outlet zone, cooling means interposed between said inlet port and said outlet port exteriorly of said enclosure for cooling said cooling fluid withdrawn from said work zone, and including means for circulating said cooling fluid through said inlet zone, through said work zone, through said outlet zone and through said cooling means.

3,860,223

MELTING FURNACE

Paul C. Berger, Paris, France, assignor to FLUXO, Pantin, France

Filed Aug. 23, 1973, Ser. No. 391,026
Int. Cl. F27b *14/00*
U.S. Cl. 266—33 R **3 Claims**



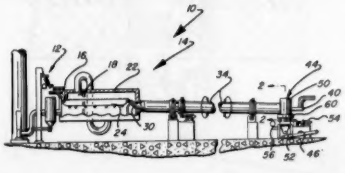
1. An improvement for a melting furnace of the type that includes a crucible, a gas-tight refractory structure surrounding the periphery of the crucible, and means for heating the crucible, the improvement comprising a wall spaced apart from the outer surface of the refractory structure, the wall surrounding the refractory structure along the sides and top thereof to form a chamber extending at least around and above the refractory structure, outlet means in the wall through which gas in the chamber can be withdrawn, first and second inlet means in the wall communicating with the outlet means, the first inlet means comprising a space between the upper periphery of the crucible and the wall through which gas emanating from the crucible can flow, the second inlet means comprising an opening in the wall through which gas can enter the chamber.

3,860,224

APPARATUS FOR USE IN PELLETIZING ORE

Daniel M. Urich, Hibbing, Minn., assignor to Eveleth Taconite Company, Forbes, Minn.

Filed Oct. 19, 1973, Ser. No. 407,777
Int. Cl. F27b *7/32*
U.S. Cl. 266—20 **3 Claims**



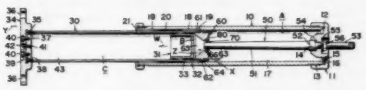
1. An apparatus for use in pelletizing ore comprising balling means for forming green pellets, a pellet hardening assembly for processing green pellets from said balling means to form pellets of a desired hardness, said hardening assembly including means for heating the pellets and indurating the pellets to a desired hardness, and cooling means for receiving hardened pellets from said hardening assembly and for cooling the hardened pellets, said cooling means including a stationary upper portion, said stationary upper portion having a stationary main wall with a circular lower end portion, said cooling means further including a movable lower portion which receives the hardened pellets, said movable lower portion having a movable main wall with a circular upper end portion disposed adjacent to and spaced apart from the lower end portion of the main wall of said upper portion to form an annular opening between said upper and lower portions, annular trough means connected with said lower portion for holding an annular body of liquid which circumscribes said main wall of said lower portion, a circular sealing wall fixedly connected with said upper portion and extending downwardly across said annular opening and into the annular body of liquid, means for rotating said lower portion and said trough means containing the annular body of liquid relative to said stationary upper portion, and means for directing a flow of air inwardly through the annular opening between the upper end portion of said lower main wall and the lower end portion of said upper main wall to retard the movement of gas and solids toward said trough means through the annular opening.

3,860,225

SHOCK ABSORBER

Masahiro Nakamura, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Aichi-ken, Japan

Filed July 23, 1973, Ser. No. 381,520
Claims priority, application Japan, Apr. 5, 1973, 48-39067; July 27, 1972, 47-75264
Int. Cl. B60g *11/26;* **F16j** *5/00*
U.S. Cl. 267—64 R **8 Claims**



1. A shock absorber, comprising:

an outer cylinder one end part of which is closed and the other end part of which is opened,

an inner cylinder which slides inside said outer cylinder and one end of which is closed,

a plunger which is coupled to the other end of said inner cylinder, an inner hole formed in said plunger,

a free piston which is housed in said inner cylinder,

a rod which is insertedly provided inside said outer cylinder and having its effective cross-sectional area reduced gradually from its root towards its front end,

a variable-area orifice formed between said inner hole and said rod by the insertion of said rod into said inner hole, and

an aperture in said plunger, said aperture extending from an end face of said plunger confronting an oil chamber in the outer cylinder and communicating said oil chamber with a jet stream area immediately downstream of said variable-area orifice whereby oil in the oil chamber of the outer cylinder flows through said variable-area orifice and also through said aperture to the jet stream area immediately downstream of the variable-area orifice to an oil chamber in the inner cylinder when a pressure drop occurs adjacent the jet stream area immediately downstream of said variable-area orifice.

3,860,226

PROTECTIVE SHROUD FOR OVERHEAD DOOR TENSION SPRING

Fred Hensiek, Jr., 743 N. Sunnyslope, Pasadena, Calif. 91107

Filed Nov. 23, 1973, Ser. No. 418,468
Int. Cl. F16f *1/12*
U.S. Cl. 267—69 **6 Claims**

1. That improvement in an overhead door counterbalance assembly of the type utilizing coil spring means at either end of a door to operate a respective door operating linkage as-

sembly, said improvement comprising a protective tubular elastomeric shroud adapted to embrace the full length of each of said coil spring means and having a relaxed length greater than the length of the associated coil spring means in the position of said linkage means when in the closed door position thereof, said shroud having a wall thickness and strength

effective to retain captive the parts of said coil spring means upon failure thereof while under load, and means for closing the ends of said shroud about an adjacent portion of said linkage assembly adjacent to opposite ends of said spring means to prevent the escape of portions of said spring means from said shroud should said spring means fail while under tensile load.

3,860,227

SPRINGS

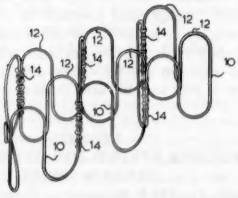
Desmond Francis Hughes, 9 Greenhill Rd., Billinge near Wigan, England

Filed June 18, 1973, Ser. No. 370,959

Claims priority, application Great Britain, Apr. 5, 1972, 15769/72

Int. Cl. F16k *3/02*

U.S. Cl. 267—103 **14 Claims**



1. A spring unit comprising a single elongate serpentine member which is deformed and constrained to define a substantially rectangular prism having spaced substantially planar portions linked to one another by resilient cross members.

3,860,228

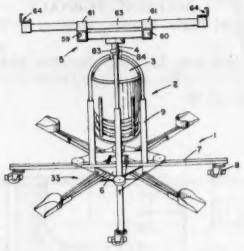
APPARATUS FOR SUPPORTING AND POSITIONING HEAVY AND CUMBERSOME OBJECTS

Henry J. Cronier, 30 Fremont St., Blind River, Ontario, Canada

Filed July 25, 1973, Ser. No. 382,332

Int. Cl. B25b *1/22*

U.S. Cl. 269—54.5 **9 Claims**



1. An apparatus for holding and positioning a workpiece in any desired position throughout substantially a hemisphere comprised of a base,

a ball joint supported by said base,

a ball supported in said ball joint with outer surface means of the ball normally in contact with inner surface means of the ball joint by means of a spring which normally biases the ball joint upwardly against the ball,

means to maintain said ball in desired positions in the ball joint,

means to release said ball for movement from one desired position to another desired position comprising a rod attached to the ball joint adapted to move downwardly to overcome the normally upward bias of the ball joint,

workpiece support means attached to said ball,

and a safety means which is normally operative to lock the release means and prevent movement of the release means when the joint is normally biased against the ball.

3,860,229

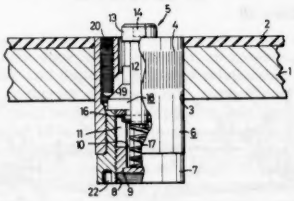
REGISTER PIN UNIT

Bert K. G. Anderson, Hagersten, Sweden, assignor to Misomex Aktiebolag, Hagersten, Sweden

Filed Jan. 24, 1974, Ser. No. 436,338

Int. Cl. B23q *3/18*

U.S. Cl. 269—316 **5 Claims**



1. A radially adjustable register pin unit comprising a housing sleeve; a register pin adapted for axial insertion into and radial displacement within said housing sleeve; mounting means within said housing sleeve cooperable with said register pin to position the latter for translatory radial movement thereof perpendicular to the longitudinal axis of said sleeve and in axially supported relation longitudinally of said sleeve; and adjusting means operatively associated with said housing sleeve and mounting means for transmitting said translatory

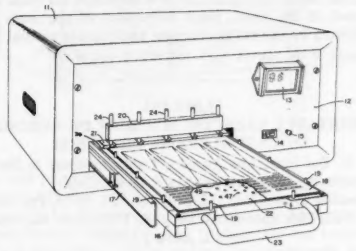
movement to said register pin and for releasably securing the latter in various positions of radial adjustment within said housing sleeve.

3,860,230

SHEET TRANSPORT AND FLATTENING APPARATUS

Michael P. Georges, P.O. Box 800, Walpole, Mass. 02062

Division of Ser. No. 47,264, June 18, 1970, Pat. No. 3,722,111.
This application Dec. 20, 1972, Ser. No. 316,760
Int. Cl. B65h 5/04
U.S. Cl. 271—3 5 Claims



1. A flexible sheet transport and sheet flattening device comprising:

a. a flat bed support for a thin flexible sheet;

b. means for translating said flat bed support to move substantially horizontally past a transverse line;

c. a guide bar positioned above and generally parallel to said transverse line and having a set of substantially vertical guide holes therein;

d. a set of rods slidably supported and downwardly urged in said set of guide holes and supported on said flat bed support as it moves past said transverse line to maintain said flexible sheet in substantial contact with said support in the vicinity of said transverse line and

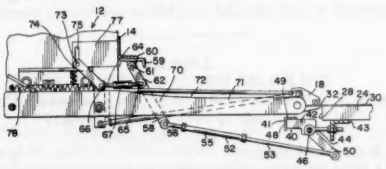
e. means carried by said flat bed support for contacting and automatically lifting said rods from contact with said flat bed support at a predetermined position thereof to facilitate insertion and removal of said sheets without contacting said rods.

3,860,231

TAKEOFF ASSIST APPARATUS AND ASSEMBLY

Claude H. Oltra, Chicago, Ill., assignor to American Screen Printing Equipment Company, Chicago, Ill.

Filed Apr. 16, 1973, Ser. No. 351,366
Int. Cl. B65h 29/10
U.S. Cl. 271—85 12 Claims



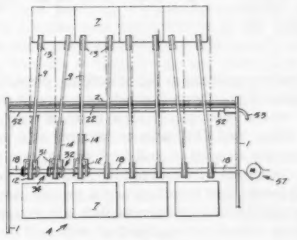
1. A takeoff assist assembly particularly adapted to allow a takeoff conveying means to easily grip stock positioned on a generally flat surface of a support means for printing or the like and to positively remove said stock from said surface, including drop edge pivotally mounted on a support means, and movable to a first or upward position to form an edge portion of a generally flat surface of said support means and thereby support a leading edge of stock positioned on said surface, drop edge actuating means mounted on a takeoff conveying means, and linkage means operatively connecting said actuating means and said drop edge means, movement of said takeoff conveying means causing movement of said drop edge actuating means mounted thereon to thereby pivot said drop edge means between said first position and a second, downward position in which the leading edge of said stock is exposed to facilitate gripping and removal of said stock by said takeoff conveying means.

3,860,232

ADJUSTABLE STACKER LAYBOY

Merrill D. Martin, No. 2 Mall Ct., Oakland, Calif. 94611

Continuation of Ser. No. 160,599, July 8, 1971,. This application Mar. 29, 1973, Ser. No. 345,895
Int. Cl. B65h 29/12; B65g 47/26
U.S. Cl. 271—198 11 Claims



1. In a layboy for transferring sheets from one machine to another,

a frame between the machines,

conveying means on the same frame having a receiving end adjacent to one machine and a delivery end adjacent to the other machine,

said conveying means including a plurality of conveyors side by side in horizontal registry and longitudinal with respect to said machines and being spaced transversely from one another to carry sheets from said receiving end to said delivery end,

releasable means to hold each of said conveyors in adjusted spaced positions,

adjustable mounting means to adjustably support one end of said conveyors,

and means to drive said conveyors,

each conveyor including

a longitudinal rigid arm extending from end to end of the conveyor,

a pulley at each end of said arm,

said means to drive said conveyors including a transverse drive shaft extending through said adjustable mounting means,

each pulley at said one end being a drive pulley and being connected to said drive means at the respective mounting means, said mounting means being adjustable on said shaft,

a conveyor belt played around said pulleys on each arm,

each belt moving longitudinally around and above and below said arm in a substantially perpendicular plane of said arm,

said releasable holding means including

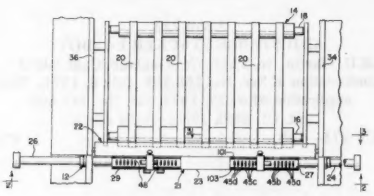
a transverse support member on said frame for said arms, and

releasable coacting means between an intermediate portion of each arm and said transverse support member to pivotably hold said arm in adjusted position along said transverse support member.

3,860,233
VACUUM OPERATED SHEET REGISTRATION MECHANISM

Harry Wiase, Chicago, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jan. 17, 1974, Ser. No. 434,164
Int. Cl. B65h 9/10
U.S. Cl. 271—239 27 Claims

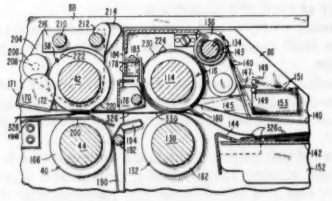


1. A feeding mechanism for selectively providing registration of material to either a first side or a second side comprising feed means movable from a nominal central location towards either said first side or towards said second side, follower means secured to said feed means, cam means positioned to cooperate with said follower means and constructed to have at least a first cam face and a second cam face, drive means for driving said cam means, first bias means for forcing said follower means into engagement with said first cam face, second bias means for forcing said follower means into engagement with said second cam face and control means for selectively causing either said first bias means or said second bias means to function, said first cam face being configurated such that said feed means will be driven from said nominal location toward said first side when said first bias means is functioning and from said nominal location toward said second side when said second bias means is functioning and material is being fed by said feeding mechanism.

3,860,234
APPARATUS FOR CONTROL OF TRAVEL OF SHEETS

Frank V. Parenti, and Robert W. Staneck, both of Dayton, Ohio, assignors to The Standard Register Company, Dayton, Ohio

Division of Ser. No. 103,620, Jan. 4, 1971, Pat. No. 3,741,451. This application Apr. 26, 1973, Ser. No. 354,526
Int. Cl. B65h 7/06
U.S. Cl. 271—263 3 Claims

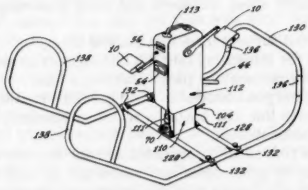


1. Apparatus for control of travel of sheets comprising:
a substantially horizontal support surface,
a shaft disposed above the support surface substantially parallel thereto,
a sleeve encompassing the shaft and rotatable with respect thereto,
resilient means engaging the shaft and the sleeve and urging pivotal movement of the sleeve,
a plurality of sheet guide arms extending from the sleeve,
means attaching the guide arms to the sleeve for movement therewith,
the arms having end portions adjacent the support surface, the resilient means engaging the sleeve and urging pivotal movement thereof in a direction to move the arms away from the support surface,
the arms including deflector means adapted to be engaged by rapidly traveling sheets to guide and direct the sheets toward the support surface, the arms being adapted to move in a direction from the support surface when force of the sheets upon the arms is sufficient for such movement of the arms, such movement of the arms being assisted by the resilient means and causing pivotal movement of the sleeve with respect to the shaft.

3,860,235
PORTABLE EXERCISE MACHINE INCLUDING MOUNTING FRAME THEREFOR

Bruce E. Del Mar, Los Angeles, Calif., assignor to Del Mar Engineering Laboratories, Los Angeles, Calif.

Division of Ser. No. 332,149, Feb. 13, 1973, Pat. No. 3,831,942. This application Dec. 19, 1973, Ser. No. 426,117
Int. Cl. A63b 23/04
U.S. Cl. 272—73 4 Claims



1. A portable exercise machine for patients in bed including: a U-shaped frame configured to rest on a bed for use by a patient lying in a prone position, said U-shaped frame including spaced and parallel side bars adapted to lie on the bed on each side of the patient and having a turned-up end portion formed by that end of the U-shaped frame forming the base of the U and adapted to rest against the foot of the bed thereby to provide stability for the machine, and said parallel side bars having turned-up ends on the opposite end of said frame from said turned-up end portion to provide hand-holds for the patient at the open end of the U-shaped frame; a unit including an inertia wheel mounted on said frame intermediate said turned up end portion and said opposite end; a pedal mechaniam mounted on said unit and coupled to said inertia wheel, said pedal mechanism being positioned to be driven by the patient in the prone position; and energy-absorbing means mounted in said unit and coupled to said inertia wheel.

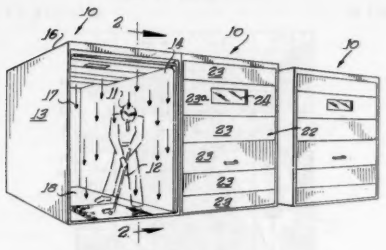
3,860,236
GOLF BALL DRIVING RANGE DEVICE

James B. Buchanan, 2360 27th St., Marion, Iowa 52302

Filed July 2, 1973, Ser. No. 375,832
Int. Cl. A63b 69/36
U.S. Cl. 273—35 B 8 Claims

1. A device for enabling golfers to practice driving golf balls in all types of weather conditions comprising a plurality of individual shelters generally in side-by-side relationship, each of said shelters comprising side, top and rear walls and a bottom all joined together to define a compartment the interior of which is sufficiently large to allow a golfer to fully swing any of the conventional golf ball driving clubs without striking any of said walls and drive golf balls therefrom, a front wall attached to said shelter, means for moving said front wall to

and from a fully open and fully closed position while remaining attached to said shelter to selectively provide access to the interior of said compartment, means selectively operable to provide a stream of air across the entire area of said front wall



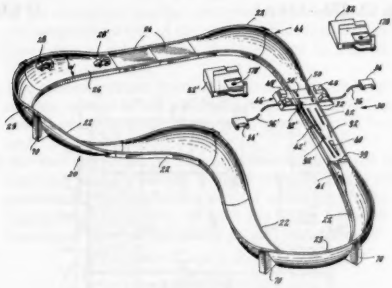
when said front wall is in an open position, said stream of air being of sufficient velocity to provide an air-door to assist in maintaining the temperature inside of said compartment, and air temperature control means to maintain the temperature inside of said compartment at a pre-selected level.

3,860,237

TOY VEHICLE RACING GAME

Julius Cooper, New Hyde Park; Burt Ensmann, Flushing; Edwin Nielsen, Oceanside, and Vincent Carella, Queens Village, all of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Filed Mar. 22, 1971, Ser. No. 126,818
Int. Cl. A63f *9/14*; **A63h** *18/00*
U.S. Cl. 273—86 R **17 Claims**



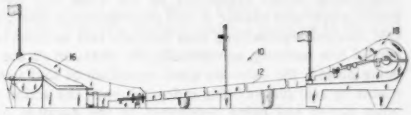
1. A toy vehicle race game comprising:
first and second toy vehicles;
a toy vehicle race track comprising at least one region of sufficient width to enable one of said vehicles to pass another, said one track region being curved as seen in plan and banked at an angle which increases from the inside of said plan curve toi the outside thereof, whereby the faster one of said vehicles moving on the outside relative to said plan curve is restrained against centrifugal escape at said faster speed;
said toy vehicles each comprising front wheels having a relatively low coefficient of friction and rear wheels having a relatively high coefficient of friction, respectively, relative to said track.

3,860,238

CONTINUOUS RACETRACK HAVING TURNAROUND PORTIONS

Shizuka Kojima, Tokyo, Japan, assignor to Tomy Kogyo Co., Ltd., Tokyo, Japan

Filed Feb. 5, 1974, Ser. No. 439,733
Int. Cl. A63f *9/14*
U.S. Cl. 273—86 C **14 Claims**



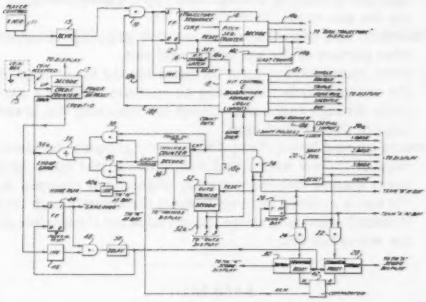
1. A continuous racing toy, comprising:
a trackway provided with a central portion, turn-around portions at each end of said central portion, each of said turn-around portions terminating upwardly from said central portion, and end portions at the ends of said turn-around portions extending downwardly and terminating inwardly of said turn-around portions at positions above said central portion, said central portion, turn-around portions and end portions being provided with a plurality of distinct, continuous paths;
racing vehicles provided within said paths; and
a propulsion unit within one of said turn-around portions consisting of wheels mounted for rotation within said paths within said one of said turn-around portions, each wheel having a plurality of spokes extending radially outward therefrom and into its associated path so as to engage the vehicle in said path and propel same through said path of said turn-around portion, and means rotating said wheels.

3,860,239

ELECTRONIC BASEBALL GAME

Peter R. Feuer, 713 Mourning Dove Rd., Audubon, Pa. 19401, and Emil Rotar, 1618 W. Olney Ave., Philadelphia, Pa. 19141

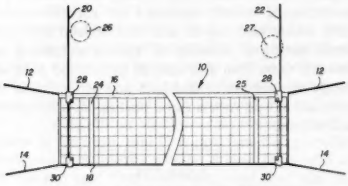
Filed Aug. 8, 1973, Ser. No. 386,720
Int. Cl. A63f *9/00*
U.S. Cl. 273—88 **13 Claims**



1. An electronic baseball game comprising, in combination, trajectory tracing means for tracing the trajectory of a pitched ball; display means connected to said tracing means for displaying said trajectory to at least one player; signalling means operated by said player for signalling when the ball is to be hit by the batter; outcome determining means connected to said tracing means for determining the outcome after said player has operated said signalling means for hitting said ball, said outcome being displayed on said display means; means in said

outcome determining means for establishing said outcome as a successful hit when said signalling means is operated within a predetermined time interval, said predetermined time interval being subdivided into a plurality of sections representing a variety of possible successful hits, the specific outcome within said time interval being dependent on the instant of time when said signalling means is operated by said player; and sections representing outs between sections of successful hits within said predetermined time interval, said outcome determining means registering an out when said signalling means is operated outside of said predetermined time interval, said sections representing outs between said sections of successful hits reducing substantially the duration of the game being played, the outcome upon operation of said signalling means by said player being independent of the action of another player and being dependent on the duration of time between the instant that the ball is pitched and the instant that said signalling means is operated by said player.

3,860,240
VOLLEYBALL NET ANTENNA CLAMP
John P. Koch, 3208 Newcastle Dr., Dallas, Tex. 75220
Filed Mar. 11, 1974, Ser. No. 449,603
Int. Cl. A63b *71/02*
U.S. Cl. 273—95 R **9 Claims**



1. In clamp apparatus for supporting a vertical antenna adjacent the sideline of a volleyball net, the combination comprising:

an upper clamp having a slot for receiving the upper edge portion of the volleyball net and further including an aperture extending through said upper clamp for receiving the antenna,

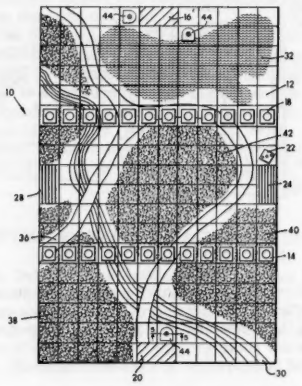
means on said upper clamp for securely gripping the upper edge portion of the net within said slot,

a lower clamp having a slot for receiving the lower edge of the net and further including an aperture extending partially through said lower clamp for receiving the lower edge of the antenna, and

means on said lower clamp for securely gripping the lower edge of the net within said slot, wherein said upper and lower clamps may be vertically aligned and clamped to the net in order to securely support the antenna such that it extends vertically above the net adjacent the sideline of the volleyball court.

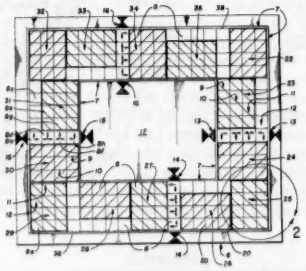
3,860,241
BOARD GAME APPARATUS
David L. Leftin, 30 W. Dane St., Beverly, Mass. 01915
Continuation-in-part of Ser. No. 220,183, Jan. 24, 1972, abandoned. This application May 9, 1973, Ser. No. 358,677
Int. Cl. A63f *3/04*
U.S. Cl. 273—134 AE **8 Claims**

1. A strategy game comprising a multi-squared board, said squares being arranged side by side in a grid pattern, a pair of opposed goals spaced apart on said board, each goal containing at least one square, a plurality of gates positioned in squares proximate said goals, each gate being moveably mounted on said board and moveable to either an open position or a closed position, a first team of pieces positioned on separate squares for defending said first goal, a second team of pieces positioned on separate squares for defending said



second goal and a chance numerical determinant to direct the movement of said pieces on said board.

3,860,242
BOARD GAME APPARATUS
Julian Clark Martin, Harris County, Tex.
Continuation-in-part of Ser. No. 146,995, May 26, 1971, abandoned. This application May 29, 1973, Ser. No. 365,030
Int. Cl. A63f *3/00*
U.S. Cl. 273—134 AE **11 Claims**



1. A game apparatus, comprising:

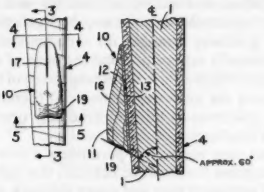
a board having on its surface a playing path, the playing path being divided in a predetermined manner into a plurality of spaces, at least some of the spaces being grouped in a plurality of sets, at least some of the sets of spaces being physically rearrangeable in the playing path; a plurality of control pattern cards for designating different preselected patterns of the spaces; and

a plurality of distinctive groups of markers, each group being indicative of one of the players or one of the teams of players, said spaces being suitably dimensioned for occupancy by the markers.

3,860,243
PUTTING AID DEVICE FOR USE ON PUTTERS

Anthony J. Prisco, Sr., 102 Beech St., Woodcliff Lake, N.J. 07675

Filed Aug. 27, 1973, Ser. No. 391,624
Int. Cl. A63b *53/14*
U.S. Cl. 273—165 14 Claims



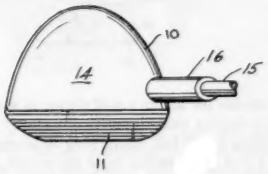
1. A putting aid device to be attached to the gripping section of a putter on the side thereof remote from the putting face of the putter to aid in controlling the position of the putting face comprising:
   a. an elongated member having a length in the range from one half to three inches, and widest at a point medially of the ends of said elongated member,
   b. said elongated member having a raised section on the outer face proximate said widest section and forming a concave inner face from side to side,
   c. attaching means connected to said concave inner face for affixing the putting aid device in assembled position on the putter,
   d. the outer face of said elongated member having a first portion extending from said raised portion to the front end of the putting aid device, and a second portion extending from said raised portion to the rear end of said putting aid device,
   e. said first portion having a concave shape from side to side at the raised portion concentric to the concave inner face of the elongated member and generally streamlined along the longitudinal line of the putting aid device and tapered from side to side towards the front end to a minimum thickness and width,
   f. said second portion forming at least one force receiving surface normal to the longitudinal line of the putting aid device and at an angle thereto in a range from 45° to 60°, and
   g. the rear end of the putting aid device adjacent the force receiving surface having a width so that in assembled position the force receiving surface will be sized to permit engagement thereof by at least the index finger of the lowermost hand of the player utilizing the putter.

3,860,244
GOLF CLUBS OF THE TYPE KNOWN AS WOODS

Floyd M. Cosby, 301 Jackson, Rosenberg, Tex. 77469

Continuation-in-part of Ser. No. 95,242, Dec. 4, 1970, abandoned. This application Nov. 29, 1972, Ser. No. 310,431
Int. Cl. A63b *53/04*
U.S. Cl. 273—167 F 2 Claims

1. Golf club of the type referred to as a wood, comprising a horizontally disposed club head having the front side thereof completely flat to form a hitting face over its entire area whereby a golf ball may be struck at any point thereof without angular deflection of the golf ball, said hitting face having a loft angle of conventional angular inclination for a wood-type club head, one end of said club head being convexly curved backwardly and entirely inwardly of one end of said hitting face and forming the heel of the club head, the other end of said club head being convexly curved backwardly and entirely inwardly of the other end of said hitting face and forming the toe of the club head, the reverse side of said club head being thickened rearwardly and convexly curved symmetrically of the horizontal center of the club head and smoothly merging with said convex curvatures of said heel and toe in order to distribute the weight of the club head symmetrically about a vertical plane perpendicular to the center of the hitting face and to adjust the horizontal center of gravity of said club head to its horizontal center whereby said club head will be less likely to twist about vertically directed axes upon striking golf balls at random points of said hitting face, the upper and lower sides of said club head and of said hitting face being substantially parallel whereby the heel and toe portions of the club



head are of substantially the same weight, a shaft having its lower end fixed to the upper side of the heel of the club head, and further having the length of said club head from the toe to heel ends being approximately 3½ inches and with the maximum distance of the shaft axis to the center of the hitting face being approximately 1¼ inches, the convexly curved heel of the club head being angularly inclined downwardly and inwardly parallel to the shaft axis from the upper edge of the heel substantially to the lower edge of the heel and being spaced conventionally no farther than five-eighths inch from the shaft axis.

3,860,245
DEVICE FOR ADJUSTING BACKSWING ARM POSITIONS OF A GOLF PLAYER

Nobuo Yamada, 1-13, Imagawa-chome, Tokyo, Japan

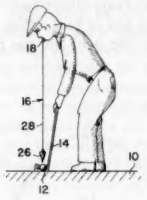
Filed May 15, 1974, Ser. No. 470,318
Claims priority, application Japan, May 18, 1973, 48-57861
Int. Cl. A63b *69/36*
U.S. Cl. 273—183 B 10 Claims

1. A device for adjusting backswing arm positions for use by golf players which comprises: a casing assembly including a peripheral wall, a bottom wall and a top wall; means for holding said casing on a wrist of a player's arm; elongated cross guide means arranged rotatably along said bottom wall in the interior of said casing assembly; and striking means disposed freely movable in the lengthwise direction from one end to the opposite end of said guide means and adapted to strike said peripheral wall of said casing assembly at said opposite end of said guide means thereby to produce a sound of impact.

3,860,246
GOLF SWING AND DEVICE

Barry M. Fish, Thornhill, Ontario, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Nov. 2, 1973, Ser. No. 412,319
Int. Cl. A63b *69/36*
U.S. Cl. 273—183 B 1 Claim

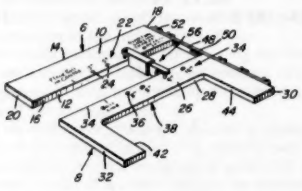


1. A device for aiding a golf player in assuming and maintaining a desired and proper bodily stance while addressing and striking a golf ball comprising an elongated mouthpiece having a first end adapted to fit the mouth of a golfer and to be securely gripped by the golfer's teeth, a cord having one end thereof secured to the opposite end of said mouthpiece, a weight member symmetrically balanced about its longitudinal axis and having upper and lower ends, the upper end of said weight member being secured to the other end of said cord in a manner such that when said weight member is hanging freely and suspended by said cord, the longitudinal axis of said weight member is substantially aligned with said cord, and the length of said cord being such that when said mouthpiece is gripped by the golfer, while addressing a golf ball with a golf club and executing a golf club swing, said weight member is freely suspended above the center of said ball to provide a means for detecting head movements of the golfer.

3,860,247
GOLF PUTTING AID

Herbert R. Taylor, 2822 Chestnut St., Montgomery, Ala. 36107

Filed July 25, 1973, Ser. No. 382,448
Int. Cl. A63b *69/36*
U.S. Cl. 273—186 C 5 Claims



1. For putting practice by a golfer, a portable putting aid designed and adapted for use indoors atop a carpet-covered surface and outdoors on a putting green comprising, in combination:

a. a first guide member elongated and rectangular in plan, having a pair of spaced, parallel planar surfaces, a longitudinal straight-edge, and transverse left and right marginal endds;

b. a second guide member arranged in a common plane with the first guide member, the second guide member being substantially U-shaped in plan and provided with spaced, parallel, planar surfaces, left and right transverse marginal edges, and a longitudinal straight-edge arranged in spaced opposed, parallel relationship with respect to the straight-edge of the first guide member, the second guide member further being provided with a recess arranged spaced from the coextensive with the straight-edges for accommodating the shoes of feet of user of the putting aid;

c. assembling and coordinating means including a rigid strap member connected to the first and second guide members along one corresponding transverse marginal edge thereof for separably uniting and maintaining the guide members in coacting relationship and providing a uniform channel-like guideway between the straight-edges, the guideway arranged for accommodating a golf ball in a manually set position and the head of a putter in ready-to-putt relationship, the arrangement of the strap member closing the guideway at one end thereof and permitting the guideway to be unobstructedly open at its opposite, ball discharging end;

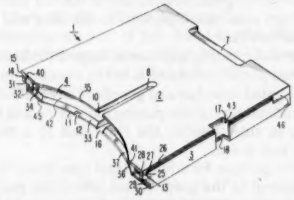
d. limit stop means for permitting a user to observe and determine the distance between the ball and putter head and serving to plan and gauge the back-stroke required to cause the ball to travel a predetermined distance when putted; and

e. retaining means provided on both planar surfaces of the first and second guide members for selectively mounting the limit stop means in a desired position on a selected pair of planar surfaces of the guide members.

3,860,248
RECORD MEMBER APPARATUS

Ronald Eugene Hunt, Austin, and William Melchior Jenkins, Leander, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 20, 1973, Ser. No. 353,182
Int. Cl. G11b *1/02, 3/68*
U.S. Cl. 274—1 R 14 Claims



1. An apparatus for receiving and storing a number of record members, and adapted to have said record members unloaded therefrom, said apparatus comprising a housing made up of top and bottom enclosures and having:

a. a first side opening of sufficient size to allow insertion of said number of record members thereinto;

b. a second side opening of sufficient size to allow passage of one of said record members therethrough;

c. a recess in said top enclosure communicating with said first side opening for facilitating mechanical unloading;

d. a groove in the bottom of said bottom enclosure extending from adjacent said first side opening and having a ramp, said groove serving as means for positioning said apparatus for mechanical loading; and

e. orientation means for insuring proper orientation for mechanical loading and unloading.

3,860,249
CASINGS FOR TAPPET RODS PARTICULARLY IN THE MOTOR VEHICLE ENGINES

Mario Farelli, Corso Giulio Cesare 298, Turin, Italy

Filed Mar. 16, 1973, Ser. No. 340,607
Int. Cl. F16j *15/12*
U.S. Cl. 277—63 9 Claims

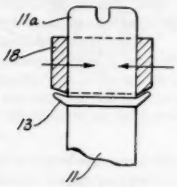
1. For use between two engine parts each of which is provided with an opening and a surface surrounding the opening,

the two surfaces facing each other, a tappet rod casing assembly comprising:

a. a tubular casing having two ends, each of the ends being adapted to fit slidably through one of the openings in the engine parts,

b. a pair of flanges projecting outwardly from the casing, each flange being near but spaced from one of the ends of the casing, and

c. a pair of resilient collars, each collar surrounding a portion of the casing between one of the flanges and the



casing end closest to that flange, and each collar when in an unstressed condition having a length measured along the length of the casing greater than the greatest thickness of the collar wall so that each collar has considerable resilience in the longitudinal direction of the casing,

d. the casing and collars being so dimensioned that when the casing ends are inserted into the openings in the engine parts, each collar is longitudinally squeezed between its respective flange and the opposed surface of the engine part surrounding the respective opening.

3,860,250

SEALING DEVICE FOR PREVENTION OF LEAKAGE BETWEEN CYLINDRICAL SURFACES

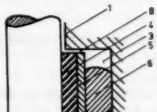
Ulf Rolfsson Lundquist, Mjolby, Sweden, assignor to Forenade Fabriksverken, Eskilstuna, Sweden

Filed Sept. 4, 1973, Ser. No. 394,091

Claims priority, application Sweden, Sept. 4, 1972, 11401/72

Int. Cl. F16j *15/24*

U.S. Cl. 277—165 **1 Claim**



1. A sealing device for prevention of leakage between cylindrical surfaces performing axial relative movements and of the type comprising a sealing ring mounted in a groove in one of said surfaces and engaging the other surface, the said sealing ring consisting of parts of polymeric material and metal of equal extent in the axial direction, an elastically deformable material being provided in said groove between said metal and the bottom wall of the groove, characterized in that the sealing ring consists of an inner, cylindric polymer part and an elastic metal ring surrounding said part and being secured thereto, the sealing ring having an axial length which is somewhat less than the axial length of the groove, the sealing ring abutting a radially extending surface limiting the groove in the axial direction against the lowest surrounding pressure.

3,860,251

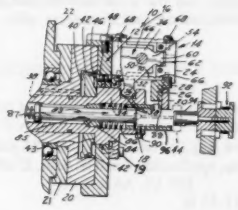
REED MOUNTED CHUCK

John W. Lovely, Springfield, Vt., assignor to Bryant Grinder Corporation, Springfield, Vt.

Filed May 29, 1973, Ser. No. 364,849

Int. Cl. B23b *31/16, 31/30*

U.S. Cl. 279—4 **3 Claims**



1. In a chuck, a body, a plurality of jaws, jaw actuating levers, a plurality of radially extending chambers therein for receiving said jaw actuating levers, journal pins associated with said levers for pivotal movement, means for rocking said levers about said journal pins, each of said jaws being mounted to two parallel reeds, and said parallel reeds mounted to said body and interconnected with said levers for yieldable defection in a radial direction when actuated by said levers, and an actuating means to simultaneously move said levers to deflect said parallel reeds thereby moving said jaws radially.

3,860,252

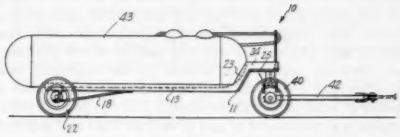
LOW CENTER OF GRAVITY TRAILER

Gust H. Martens, and Phillip E. Runyan, both of Arapahoe, Nebr. 68922

Filed July 26, 1973, Ser. No. 382,772

Int. Cl. B62d *53/08*

U.S. Cl. 280—2 **2 Claims**



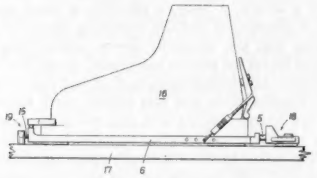
1. In a low center of gravity trailer for carrying heavy loads over rough surfaces, a generally horizontal elongate frame including a pair of spaced parallel frame members, transverse members and X bracing securing said frame members together, a transverse eyebeam supporting the rear end of said frame and extending transversely thereacross, a pair of brace members having their rear ends secured to the outer ends of the eyebeam and having their forward ends respectively secured to the frame members of the frame, said brace members preventing the eyebeam from flexing during use, stub axles secured to the ends of the eyebeam and having rear wheels journalled thereon, an upwardly and forwardly offset sloping extension on the forward end of said frame and said extension having a horizontal front extension secured thereto and said front extension including a horizontal plate member rigidly secured thereto, a cylinder secured to said plate member in depending relation thereto, a brace web extending angularly between the cylinder and said plate member, a horizontal plate element secured to the lower end of the cylinder, a sleeve secured between the plate member and the plate element concentrically with the cylinder, a plate piece supporting the plate element and adapted to rotate with respect thereto, a pair of ears rigidly secured to said plate piece in spaced parallel relation and depending therefrom, a generally rectan-

gular bolster positioned between the ears, a longitudinally extending generally horizontal pivot pin extending through the ears and the bolster to pivotally secure the bolster to the ears, a vertical pivot pin extending downwardly through the plate member, through the sleeve and to the plate element and plate piece so that the bolster may swing about a vertical axis, a retainer pin extending through the sleeve to secure the last-named pivot pin in position, a transverse axle extending through the bolster and out each side thereof, and a pair of front wheels journalled on said transverse axle.

3,860,253
SKI BINDING

Gottfried Schweizer, Vienna, Austria, assignor to Gertsch AG, Zug, Switzerland

Filed Aug. 3, 1973, Ser. No. 385,458
Claims priority, application Austria, Sept. 8, 1972, 7698/72
Int. Cl. A63c *9/08*
U.S. Cl. 280—11.35 D **11 Claims**



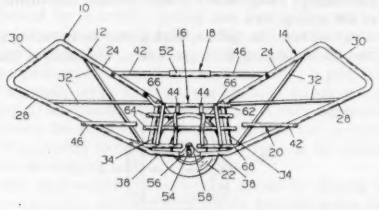
1. In a ski binding having a front and a rear binding part mounted on a ski each being adapted to cooperate with means on one of a ski boot and a bottom plate on which a ski boot is mounted for effecting a releasable securement of one of said ski boot and said bottom plate to said ski, the improvement comprising wherein one of said front and rear binding parts includes means defining an elongated pin mounted on one end of one of said ski boot and said bottom plate and extending parallel to the longitudinal axis of said ski and means defining a recess mounted on said ski and adapted to receive said pin therein for longitudinal sliding movement with respect thereto, and wherein the other of said front and rear binding parts includes securement means (1) for releasably holding the other end of one of said ski boot and said bottom plate against at least a lateral movement and (2) for preventing a longitudinal movement of one of said ski boot and said bottom plate relative to said ski whereby the permitted relative movement between said pin and said recess means will thereby facilitate a bending of said ski without varying the force holding one of said ski boot and said boot plate onto said ski.

3,860,254
FOLDABLE PACKER

Harold William Wegener, 9122 Fletcher Dr., La Mesa, Calif. 92041

Filed Oct. 26, 1970, Ser. No. 83,799
Int. Cl. B62b *11/00*
U.S. Cl. 280—36 R **2 Claims**

1. A foldable and portable load carrying packer vehicle, comprising an axle having a single wheel journaled thereto; a pair of modified U-shaped main frame members each having a closed end and a converging open end; hinge means for hingedly connecting said open ends of said U-shaped main frames to said axle and for hingedly interconnecting said open ends about an axis parallel to said axle, said closed end of each of said main frame members forming a handle, said hinge means permitting said main frame members to be superposed relative to each other into a folded position and said handles to be rotated in circular arc away from each other into a unfolded operative position; a transverse brace rigidly connected to the legs of each of said U-shaped main frame members adjacent and parallel to said axle; a load carrying platform of a generally rectangular configuration hingedly connected adjacent one edge portion thereof to one of said U-shaped main frame members and pivotable about an axis parallel to said axle with the opposite edge portion thereof

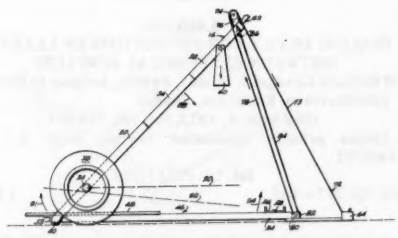


adapted to rest on said transverse brace of the other U-shaped main frame member when said packer vehicle is in said operative unfolded position; locking means operatively interconnecting said U-shaped main frame members for maintaining said packer vehicle in said operative unfolded position.

3,860,255
LIFT TRAILER

Rafael Rodriguez, 6765 S.W. 19 Ter., Miami, Fla. 33155

Filed Dec. 3, 1973, Ser. No. 420,772
Int. Cl. B62d *21/14*
U.S. Cl. 280—43.19 **7 Claims**



1. A lift trailer for selective coupled engagement with a tow vehicle comprising,

A. a main frame including,
1. an enlarged rear portion providing, a pair of spaced apart rear side rails,
2. a forwardly extending tongue portion connecting to said rear side rails,
3. a pair of axially aligned wheel spindles, fixed to and extending outwardly from the respective rear side rails to mount a pair of wheels,
4. a transverse bar, fixed between the rear ends of said rear side rails, substantially rearwardly of said wheel spindles;

B. a secondary frame including a forwardly extending tongue portion;

C. load-carrying means fixed to said secondary frame;

D. means to rotatably journal said load-carrying means and secondary frame to said transverse bar;

E. latch means for selectively latching said main frame and secondary frame to said transverse bar;

F. latch means for selectively latching said main frame and secondary frame tongues to maintain said frames in a generally coplanar, horizontal disposition above the ground level or unlatching said tongues relative to each other to permit said secondary frame and load-carrying

means to drop to ground level and to simultaneously tilt said main frame forwardly and upwardly;

G. leg means pivotally connected to said main frame tongue to maintain the trailer in a generally horizontal attitude when said tongues are latched;

H. winch means connected to said secondary frame tongue;

I. pulley means on said main and secondary frame tongues;

J. cable means from said winch, extending around said pulley means to realign said frames upon actuation of said winch, with said latch means in an unlatched condition;

K. said pulley means comprising a first pulley mounted atop the forward end of said main frame tongue and a second pulley mounted relative to the forward end of said secondary frame tongue;

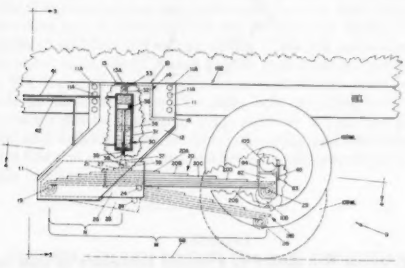
L. said cable means comprising a cable extending outwardly from said winch, upwardly and over said first pulley, downwardly and around said second pulley and upwardly to a point of attachment to the forward end of said main frame tongue.

3,860,256

RETRACTABLE TAG-AXLE ASSEMBLY FOR OVERLAND VEHICLES

William E. Jackson, 3726 Ernst St., Omaha, Nebr. 68112, and James M. Becker, Rt. No. 1, Box 236A, Arlington, Nebr. 68002

Filed Feb. 14, 1974, Ser. No. 442,370
Int. Cl. B60g *17/00*
U.S. Cl. 280—81 R **9 Claims**



1. In combination with a longitudinally extending overland vehicle having an operator's station and including at least one transversely extending non-driven so-called tandem-axle carrying at least one revolvable depending wheel located on each lateral side of the vehicle lengthwise-axis, said improved tag-axle assembly including upward retraction means and downward pressing means for the tandem-axle and comprising on each lateral side of the vehicle lengthwise-axis:

A. An elongate longitudinally extending springy-beam having its leading portion pivotably attached to a fulcrum maintained at constant elevation by a hanger member depending from the vehicle main frame, said springy-beam having its trailing portion at a trail-site attachably associated with the transversely extending tandem-axle whereby the springy-beam has a finite overall-length measured from fulcrum to trail-site and whereby the gravitational force comprising the combined weights of the tandem-axle and rotatable wheels cause the beam to pivot downwardly about the fulcrum;

B. An elongate piston of the casing and double-acting plunger components type, one said piston component being pivotably attached to the vehicle frame above said elongate springy-beam and the other said piston component being ultimately pivotably associated with the springy-beam at a medial-pivot location situated a minimal offset-length longitudinally from the fulcrum toward the trail-site whereby the springy-beam overall-length bears a thrust-ratio of at least three with respect to said offset-length; and

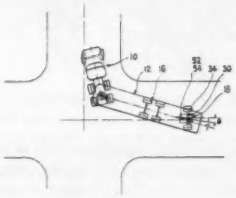
C. Control means located at the operator's station for forceably introducing motive fluid into the double-acting piston to govern the length thereof whereby the tandem-axle wheels are selectably pressed downwardly against and retracted upwardly from the vehicle underlying substrate and solely by virtue of the piston elements within the same tag-axle assembly.

3,860,257

SELF-TRACKING BOGIE ASSEMBLY FOR A TRACTOR OR TRAILER VEHICLE

Xavier Mesly, 775 Vimy, Quebec, Canada

Filed May 29, 1974, Ser. No. 474,203
Int. Cl. B62d *53/06*
U.S. Cl. 280—81 A **14 Claims**



1. A self-tracking bogie assembly for a tractor or trailer vehicle having an elongate frame, comprising in combination:

a. truck means disposed beneath a portion of said elongate frame; said truck means including:

1. supporting frame means;
2. a transverse axle attached to said supporting frame means; and
3. a plurality of road wheels journaled to said transverse axle;

b. first pivot means extending vertically through said supporting frame means, the vertical axis of said first pivot means being offset with respect to an horizontal axis extending through said transverse axle;

c. second pivot means mounted to said elongate frame frontwardly of said first pivot means in the longitudinal axis of said elongate frame;

d. coupling means connected, at one end thereof, to said second pivot means and, at the other end thereof, to said first pivot means for drawing said truck means; and

e. tie means having one end attached to said elongate frame and the other end attached to said supporting frame means; said coupling means and said tie means connecting said truck means to said elongate frame and together cooperating to allow an angular displacement of said truck means about said second pivot means and a further angular displacement of said truck means about said first pivot means.

3,860,258

BUMPER SUPPORT AND ENERGY ABSORBING FRAME SYSTEM FOR A MOTOR VEHICLE

James R. Feustel, Taylor; Kenneth L. Hoyt, Farmington, and Jonas Valukonis, Detroit, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 5, 1972, Ser. No. 295,380
Int. Cl. B62d *21/02*
U.S. Cl. 280—106 R **10 Claims**

1. An energy absorbing system for a motor vehicle comprising:

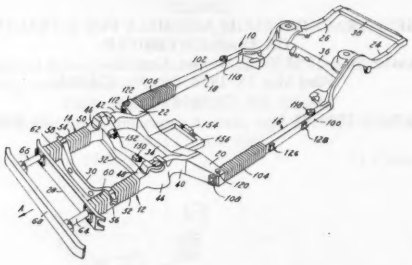
a vehicle frame assembly having longitudinally extending frame rails,

body mounting means and engine mounting means connected to said frame assembly and constructed to support a vehicle body and a vehicle engine on said frame assembly,

said rails having portions enclosed on at least three sides,

energy absorbing bumper supports of elongated construction connected to said frame rails,

said bumper supports having means extending longitudinally within the three sides of said rail portions and connected to said frame assembly,



a bumper bar extending transversely of said frame assembly and connected to said energy absorbing bumper supports, said energy absorbing bumper supports being linearly deflectable under minor impact loads whereby said minor loads are absorbed,

said rail portions being linearly plastically deformable under a longitudinally directed major impact load above a predetermined minimum,

said means of said bumper supports extending within said rail portions and engaging an interior surface of said rail portions and supporting said rail portions against lateral buckling during the linear plastic deformation thereof under said major impact load.

3,860,259

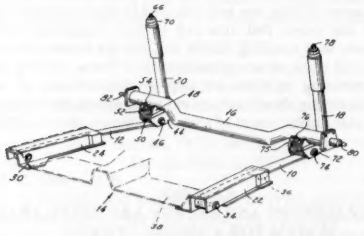
REAR SUSPENSION SYSTEM FOR MOTOR VEHICLE

William D. Allison, Grosse Pointe Farms, Mich., and Donald G. Sippel, Basildon, England, assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 3, 1973, Ser. No. 421,475

Int. Cl. B60g *11/58*

U.S. Cl. 280—124 R **14 Claims**



1. A suspension system for a motor vehicle having a transversely extending rigid axle,

left and right road wheels rotatably supported at the outer ends of said axle,

vehicle body structure,

left and right axle positioning members having their forward ends pivotally connected to said body structure,

left and right bracket means,

said left and right axle positioning members being pivotally connected to said left and right bracket means, respectively,

left and right telescopic shock absorbers,

said shock absorbers having their lower ends rigidly secured to said left and right bracket means and their upper ends connected to said body structure,

resilient means connecting said bracket means to said axle housing,

said resilient means defining a longitudinal extending pivot axis between each of said brackets and said axle.

3,860,260

SAFETY BELT FOR VEHICLES

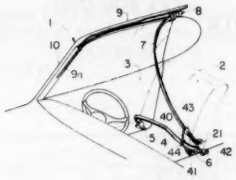
Kenichi Kazaoka, Nagoya; Kimiharu Hirose, Obu; Yasuo Takeshita, Toyota, and Hisao Matsumoto, Toyohama, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya City, Japan

Filed Dec. 20, 1972, Ser. No. 316,719

Claims priority, application Japan, Dec. 24, 1971, 47-1410; Dec. 24, 1971, 47-1411

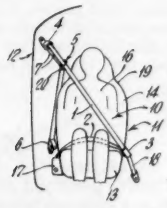
Int. Cl. B60r *21/02*

U.S. Cl. 280—150 SB **6 Claims**



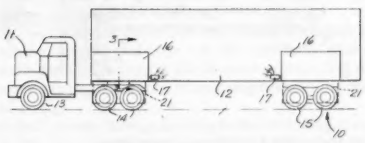
1. A seat belt device in a vehicle containing at least one door, a seat, and floor, roof and pillar vehicle elements, said device being for securing a passenger to said vehicle seat in the absence of manual manipulation, said device comprising; a waist belt permanently anchored at one end thereof to the vehicle door and at the other end to a portion of the vehicle opposed to said door on the seat or the floor; retracting means fastened to one of said belt ends for securing said waist belt to said door or vehicle portion; a shoulder belt having one end permanently anchored to a roof side portion of the vehicle body immediately over the shoulder of a passenger in said seat; a second retracting means securing the other end of said shoulder belt to a portion of the vehicle opposite to said door on the seat side or the floor; a string member linking said waist and shoulder belts so as to form a preset space between said belts in a passenger protecting position while permitting said space to vary upon displacement of both said belts; a guide track extending closely along a curvature of the roof side from a portion thereof proximate the end of said shoulder belt over the passenger's shoulder toward the lowermost end of a front pillar of the vehicle; sliding guide means adapted to freely slide within said track and engage said shoulder belt in freely slidable relation therewith; driving means; a cable connecting said driving means to said sliding means; and means for controlling said driving means in response to ingress or egress motion of the passenger so as to respectively displace said shoulder belt and said waist belt into the protecting or unprotecting position rendering it unnecessary for the passenger to manually strap to or release his body from the vehicle seat.

3,860,261
VEHICLE SAFETY BELT SYSTEM
Takezo Takada, Hikone, Japan, assignor to Takata Kojyo Co., Ltd., Tokyo, Japan
Filed May 7, 1973, Ser. No. 357,994
Claims priority, application Japan, May 13, 1972, 47-55124
Int. Cl. B60m ; B60r
U.S. Cl. 280—150 SB 7 Claims



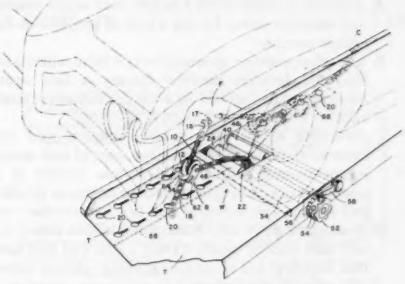
1. A safety belt system for restraining an occupant in a vehicle seat comprising a shoulder belt extending diagonally across the front of the occupant from a lower first point at a first side relative to said seat to an upper second point above the level of the shoulder of said occupant at a second side opposite said first relative to said seat means including a deflector member engaging said shoulder belt for deflecting said shoulder belt rearwardly from the path of said shoulder belt between said first and second points, a first belt guide member mounted to the body of said vehicle at said second point and a belt retractor device mounted to said vehicle body below said guide member, said shoulder belt extending from said retractor device along said guide member to said first point, and said deflector member interconnecting said belt between said first and second points and between said second point and said retractor device.

3,860,262
SIDE SPLASH GUARD FOR TRAILER TRUCKS AND WHEELS OF A ROAD VEHICLE
Harford E. Goings, P. O. Box 64, Manassas, Va. 22110
Filed Oct. 24, 1973, Ser. No. 409,146
Int. Cl. B62b 39/00
U.S. Cl. 280—154.5 R 5 Claims



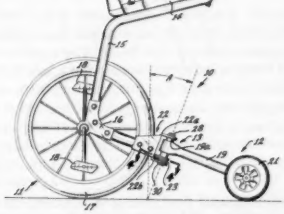
1. A side splash guard for wheels of a road vehicle comprising a housing secured to the side of the vehicle overlying and spaced outwardly from the support wheels of said vehicle, a substantially rigid panel parallel to the longitudinal axis of said vehicle and slidably mounted in said housing for vertical sliding movement into and out of the bottom of said housing, means on said housing for moving said panels into and out of said housing, and remote control means on said vehicle for controlling the means moving said panels into and out of said housing.

3,860,263
UNIVERSAL TIEDOWN DEVICE
Glenn E. Taylor, 1345 Bankhead Ave., Atlanta, Ga. 30318
Filed June 27, 1973, Ser. No. 374,104
Int. Cl. B60p 7/08
U.S. Cl. 280—179 R 8 Claims



1. A universal equipment tie down device for securing equipment in fixed position on a vehicle transport, having a generally horizontal vehicle supporting track, comprising in connection with each track, a rigid frame secured to the under side of said track beneath an opening in said track, a windlass, including a rotatable windlass drum mounted for rotation in said frame beneath said opening, a flexible tension element operatively connected to said drum and extending through said opening, and means for rotating the drum to wind said tension element therearound, a block and tackle means, including a block above the level of said track, having a sheave rotatable therein, said tension element extending around said sheave and having a free end, with means at said free end for connection to the equipment to be tied down, a flexible tether chain connecting said block to said track, and means adapting said track for selective connection to said tether chain at any of a plurality of horizontally spaced locations relative to said track.

3,860,264
LEAN VELOCIPEDE
Raymond J. Douglas, Lomita; Edward W. Libby, Hermosa Beach, and Leonard R. Moquin, Los Angeles, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Jan. 15, 1973, Ser. No. 323,544
Int. Cl. B62k 5/06, 21/10
U.S. Cl. 280—266 5 Claims



1. A velocipede comprising:
1. a front wheel assembly having a front wheel rotatably mounted thereto on a first axis of rotation;
2. a rear wheel assembly having a pair of rear wheels rotatably mounted thereto on a second axis of rotation; and
3. steering means coupling said front wheel assembly to said rear wheel assembly, said steering means located approxi-

mately half-way between the respective vertical planes of said first axis of rotation and said second axis of rotation and normally biasing said front and rear wheel assemblies to maintain said respective vertical planes in a parallel relationship, and said steering means being responsive to the weight shifting of a rider of said velocipede to provide horizontal displacement of said respective vertical planes, said steering means comprising:

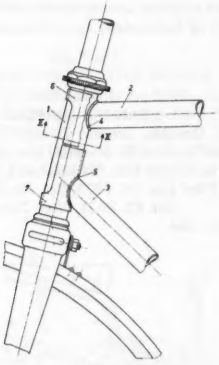
A. a sleeve member affixed to said rear wheel assembly, said sleeve member having a pair of projections and a hollow portion;

B. a bracket member mounted to said front wheel assembly, said bracket member having a first opening thereon and further having a top and bottom extension, each of which has a respective opening;

C. retaining means for rotatably coupling said sleeve member to said bracket member, part of said retaining means passing through said hollow portion of said sleeve member and said respective openings of said top and bottom extensions of said bracket member; and

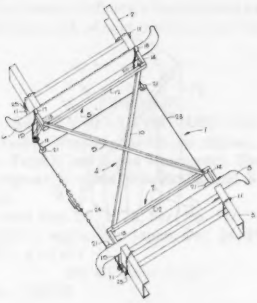
D. biasing means rotatably mounted to said sleeve member, said biasing means having a first end and second end, said first and second ends being retained between said pair of projections of said sleeve member and further retained within said first opening of said bracket member.

3,860,265
BICYCLE FRAME
Franz Weiss, Sportplatzstrasse 7a, A-8580 Koflach, Austria
Filed Aug. 27, 1973, Ser. No. 392,084
Claims priority, application Austria, Dec. 11, 1972, 10509/72
Int. Cl. B62k *3/02*; **F16l** *55/16*
U.S. Cl. 280—281 **2 Claims**



1. A bicycle frame comprising a plurality of metal tube elements interconnected to form the frame, welding seams joining respective ones of the tube elements together, and a protective element mounted on one of the joined tube elements in the region of each welding seam and at least partially covering the seam, the protective element consisting of two parts at least partially encompassing the one tube element and forming a sleeve thereabout in the region of the welding seam, and the sleeve parts defining a cutout receiving the other tube element joined to the one tube element.

3,860,266
VEHICLE TOWING APPARATUS
Robert Frank, Stillwell, and David G. Mathis, Overland Park, both of Kans., assignors to Superior Towbar Manufacturing Co., Inc., Olathe, Kans.
Filed Mar. 12, 1973, Ser. No. 340,361
Int. Cl. B60d *1/16*
U.S. Cl. 280—458 **7 Claims**



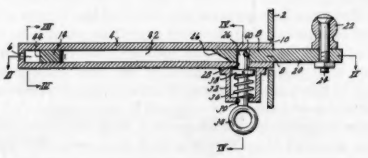
1. A vehicle towing apparatus comprising:

a. a spacing frame including a first and second crossbar assembly disposed on opposite ends of said spacing frame, each of said first and second bar assemblies being fashioned so as to facilitate engagement thereof with the bumpers of the towing and towed vehicles when the towing apparatus is in use; and a pair of spacer members extending between said first and second crossbar assemblies, each of said spacing members having respective opposite ends thereof pivotally connected to the respective first and second crossbar assemblies;

b. flexible, securing members functionally supported by said spacing frames; and

c. means for tightening said flexible securing members, said means for tightening said flexible securing members being functionally attached to said flexible securing members.

3,860,267
TRAILER HITCH BAR
Donald W. Lyons, Box 448, Fort Scott, Kans. 66701
Filed Sept. 14, 1973, Ser. No. 397,442
Int. Cl. B60d *1/16*
U.S. Cl. 280—478 B **2 Claims**



1. A trailer hitch bar device comprising:

a. a sleeve member adapted to be affixed to a towing vehicle to extend generally parallel to the direction of vehicle travel and opening rearwardly,

b. a hitch bar normally coaxial with and carried for unidirectional sliging movement in said sleeve for movement between forward and rearward positions, and extending rearwardly from said sleeve in said latter position,

c. a towing vehicle hitch element affixed to the rearwardly extended end portion of said hitch bar,

d. a pin insertable transversely through said sleeve adjacent the open rearward end thereof, said pin being engageable selectively either in a closely fitting hole provided there-

for in said hitch bar adjacent its rearward end, whereby to latch said hitch bar in its forward position, or in a longitudinally elongated slot formed therefor in said hitch bar forwardly of said hole, whereby to serve as a stop limiting rearward movement of said hitch bar, said hitch bar being laterally pivotable relative to said sleeve on said pin when said hitch bar is in its rearward position,

e. resilient means carried by said sleeve and biasing said pin in a direction to project through said sleeve, and

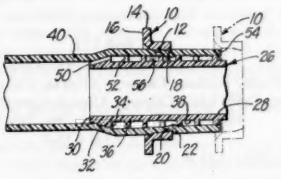
f. mannually operable means for retracting said pin from said sleeve against said biasing means, said hitch bar being formed to present a cam surface at the rearward end of the slot thereof, said cam surface being operable as said hitch bar approaches said forward position to deflect said pin outwardly from said sleeve against said biasing means.

3,860,268

TUBE LOCKING STRUCTURE

David G. Zeman, 10030 Greenleaf Ave., P.O. Box 3021, Santa Fe Springs, Calif. 90607

Filed Jan. 2, 1973, Ser. No. 320,107
Int. Cl. F16l *55/00, 33/08*
U.S. Cl. 285—14 **2 Claims**



1. In a structure in which a flexible, thermoplastic tube is held upon the exterior of a nipple the improvement which comprises:

said nipple having an end over which said tube is capable of being located so that said tube extends along the exterior of said nipple and a tapered exterior which decreases in diameter away from said end,

a rigid, generally cylindrical ring having a tapered interior located around said tube and the exterior of said nipple, barb means located on the interior of said ring so as to extend from the interior of said ring towards the center of said ring,

said barb means having holding faces extending transverse to the axis of said nipple on the extremeties thereof remote from said end of said nipple,

said exterior of said nipple being defined by a plurality of holding flanges extending around and outwardly from said nipple and being spaced from one another,

said flanges gradually decreasing in diameter away from said end of said nipple,

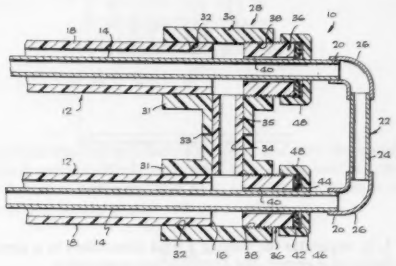
said ring holding said tube under compression between the interior of said ring and the edges of said flanges, said barb means engaging said tube so as to deform said tube generally towards the space between and adjacent to said flanges, the interior of said ring extending generally parallel to the exterior of said nipple.

3,860,269

COAXIAL TUBE COUPLER ASSEMBLY

Lawrence R. Horton, 4451 Totana Dr., Tarzana, Calif. 91356; Charles A. Jackson, 1458 Norwich Ave., Thousand Oaks, Calif. 91360; William P. Holcomb, 31803 Tyneborne Ct., Westlake Village, Calif. 91360, and Catherine Horton, 4451 Totana Dr., Tarzana, Calif. 91356

Filed Aug. 22, 1973, Ser. No. 390,436
Int. Cl. F16l *11/12*
U.S. Cl. 285—47 **1 Claim**



1. An improved coaxial tube coupler assembly comprising, in combination:

a. a first and second spaced pair of coaxially aligned tubes, one end of the inner tube of each said pair extending beyond the adjacent end of the outer tube of each said pair, said adjacent end being open;

b. means interconnecting said one ends of said inner tubes for fluid transfer therebetween;

c. a coupler sealingly disposed around said open ends of said outer tubes and maintaining said outer tubes in said spaced relation, said coupler defining an internal passageway between said open ends for fluid transfer therebetween;

d. wherein said inner tubes extend through said coupler and are supported in relation thereto and wherein said interconnecting means is disposed outside of said coupler;

e. wherein support means are releasably secured to said coupler and wherein said inner tubes extend therethrough and are supported thereby;

f. wherein said coupler defines a pair of spaced aligned passageways extending therethrough; within which aligned passageways said open ends of said outer tubes are disposed and supported, said internal passageway extending into communication with said aligned passageways, said open ends of said outer tubes terminating in said aligned passageways at about said internal passageway;

g. wherein plug means are releasably disposed in said aligned passageways to seal the same and define with said outer tubes a portion of said internal passageway;

h. wherein said plug means comprise support means which define apertures therethrough with which portions of said inner tubes are sealingly disposed and supported;

i. wherein said inner tubes are heat exchange tubes, wherein said interconnecting means are disposed outside of said coupler, and wherein said tube pairs are parallel with each other;

j. wherein said inner tubes are heat exchange tubes, wherein said outer tubes are thermally insulative tubes and wherein said coupler and plug means are also thermally insulative;

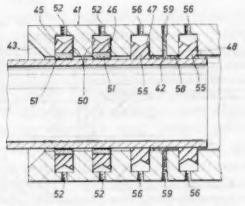
k. wherein said inner tubes comprise metal and wherein said outer tubes, coupler and plug means comprise plastic;

wherein said plug comprises a threaded plastic reducing nipple, wherein said metal comprises copper and wherein said interconnecting means comprises a length of tube secured to said inner tube ends via tube elbows.

3,860,270
APPARATUS FOR EFFECTING A CONNECTION TO A TUBULAR MEMBER OR THE LIKE

James F. Arnold, Houston, Tex., assignor to HydroTech International, Inc., Houston, Tex.

Continuation of Ser. No. 185,084, Sept. 28, 1971, abandoned.
This application Apr. 26, 1973, Ser. No. 354,798
Int. Cl. F16l 35/00
U.S. Cl. 285—93 7 Claims



1. In apparatus for making a rigid connection to a generally cylindrical member, the combination comprising:

a housing arranged for mounting in telescopic relationship over said cylindrical member, said housing having three axially spaced apart generally channel shaped annular recesses extending around the internal surface of said housing and facing radially inwardly;

an annular resilient seal mounted in each of said recesses and contacting both side walls thereof to form annular closed chambers radially therebehind, with two of said axially adjacent seals being arranged for sealing engagement between said housing and said cylindrical member upon radial deformation thereof and forming an annular testing chamber therebetween;

means supported adjacent the radially inward side of the other of said seals and at a plurality of circumferentially spaced positions for engaging said cylindrical member and locking said housing therewith in said telescopic position upon actuation thereof;

means for fluid pressurizing said annular chambers to thereby deform said seals radially inwardly, whereby said seal adjacent said locking means urges said locking means radially inward to said locking position and said other seals are moved to said sealing positions;

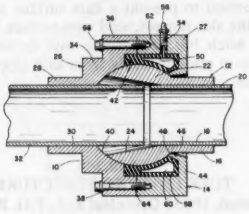
and means for fluid pressurizing said testing chamber to thereby test the seals between said housing and said cylindrical member.

3,860,271
BALL JOINT PIPE COUPLING

Fletcher Rodgers, Alva, Okla. 73717

Filed Aug. 10, 1973, Ser. No. 387,441
Int. Cl. F16l 27/06
U.S. Cl. 285—97 2 Claims

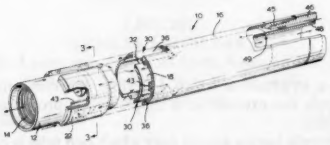
1. A ball joint coupling comprising an inner element having a sleeve portion with an enlarged spherical portion at one end thereof, said inner element having a central bore extending longitudinally therethrough for receiving the end of one pipe section therein; an outer element having a flanged sleeve member with a central bore extending therethrough for receiving the end of a second pipe section therein, said outer element also including a cylindrical member having an inner end removably secured to the flanged sleeve member; said flanged sleeve member and said cylindrical member providing a spherical recess for receiving the spherical portion in said outer element, said flanged sleeve member and said cylindrical member being provided with cooperating annular recesses to provide an annular recess surrounding the spherical portion in the engaged position of the coupling, the outer end of said cylindrical member having an inwardly directed circumferential flange terminating in an inwardly directed and tapered sleeve portion, the inner end of said tapered sleeve portion being spherically shaped complementary to the outer periphery of the spherical portion and engaging said outer periphery in the engaged position of the coupling; a yieldable sealing member disposed in said annular recess and surrounding the spherical portion in the engaged position of the coupling, said yieldable sealing member being provided with an inner contoured surface engaging said spherical portion, said yieldable sealing member being provided with an internal chamber for receiving a pressure fluid therein, valve means provided on said yieldable sealing member for admitting fluid into the internal chamber, means provided in said cylindrical member in communication with said valve means for selectively injecting said fluid into the internal chamber whereby said yieldable sealing member exerts pressure on said spherical portion for retaining the engaged position for the coupling and providing an efficient sealing of the joint between the pipe sections.



3,860,272
DRILL PIPE CONNECTOR

Floyd Walter Becker, Calgary, Alberta, Canada, assignor to Becker Drills Ltd., Calgary, Alberta, Canada

Filed May 2, 1973, Ser. No. 356,703
Int. Cl. F16l 47/00
U.S. Cl. 285—133 A 7 Claims



1. An assembly for adapting a peripheral-return bit to a reverse circulation double-walled drill-pipe which includes an outer pipe and an inner pipe concentric with said outer pipe, said assembly comprising:

a bit holder having a wall defining an internally threaded bit-supporting passage,

an outer and an inner cylindrical member coaxial with one another, the outer cylindrical member partially overlapping said bit holder,

means defining a sealed passageway extending through the wall of said bit holder from said bit-supporting passage into the annular space between said cylindrical members, and means extending through said inner and outer cylindrical members defining at least one aperture communicating the interior of the inner cylindrical member with the periphery of the bit holder, said at least one aperture being sealed against communication with said annular space,

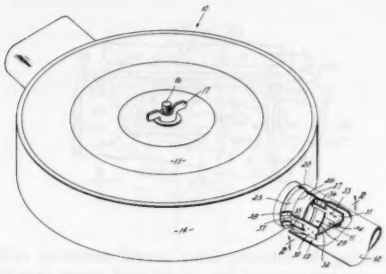
the outer and inner cylindrical members, at their ends remote from the bit holder, being adapted to sealed attachment to, respectively, said outer and inner pipes.

3,860,273

CLAMP FOR AIR FILTER HOSE

Steve Petrus, Conneautville, Pa., assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed May 7, 1973, Ser. No. 357,946
Int. Cl. F16l 33/00
U.S. Cl. 285—244 21 Claims



1. Apparatus for connecting a hose, having a longitudinal axis, to a mating tubular element having opposite interior and exterior surfaces, said hose being slipped over the exterior surface of said tubular element and said clamp being attached to and disposed at least partially within said hose to cooperate with an end of said tubular element to connect said hose thereto, said apparatus comprising,

a pair of clamping members, each of said members having three fingers,

an integral connector connecting said clamping members one to the other, said connector having a thickness and width greater than said thickness, said width of said connector lying in a plane parallel to the longitudinal axis of said hose,

said connector having a length approximately equal to the internal diameter of the hose,

means connecting said clamping members to said hose,

at least one of said fingers of each clamping member, when said hose and clamp are pushed over said tubular element, engaging one surface of said tubular element and the other fingers of the respective clamping member engaging an opposite surface in order to grip said tubular element and connect said hose thereto.

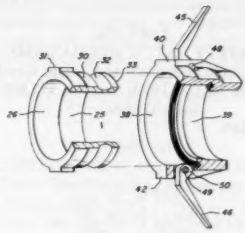
3,860,274

PIPE COUPLING

Richard L. Ledstrom, 3465 County Rd., Long Lake, Minn. 55429, and Lloyd M. Teeuwen, 2016 Mendelssohn Ave., Minneapolis, Minn. 55427

Filed July 2, 1973, Ser. No. 375,591
Int. Cl. F16l 37/00, 37/18
U.S. Cl. 285—312 8 Claims

1. Pipe coupling comprising: a pair of members adapted to be connected respectively to conduit members and to detachably couple and seal the same at said coupling; one of said members telescopically fitting into the other of said members to be sealed therein, said one member having an internal cylindrical surface of predetermined dimension with an external shoulder portion and a circular grooved surface positioned in said external said shoulder portion, said other member having an internal shoulder portion adjacent an internal cylindrical surface of the same predetermined dimension as the internal cylindrical surface of said one member; said internal shoulder portion of the other member being adapted to receive in telescopic relationship the external shoulder portion of said one member; a recessed groove positioned in the internal shoulder portion of said other member between the sides of said internal shoulder portion; a sealing ring positioned in said recessed groove and being contacted by a surface of the external shoulder portion of said one member which projects into the recessed groove; and cam levers pivoted on said other member and having eccentric cam surface thereon adapted to



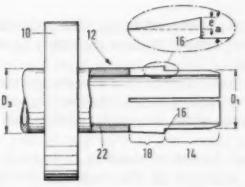
be rotated through said other member and into the circular grooved surface of said one member to bring said members together in a telescopic and near abutting relationship and against the sealing ring to seal the coupling.

3,860,275

INTERNAL CONDUCTOR MALE TUBULAR MEMBER

George Spinner, Erzgiebereistr. 33, 8 Munich 2, Germany

Filed Mar. 19, 1973, Ser. No. 342,383
Claims priority, application Germany, Mar. 24, 1972, 7211401
Int. Cl. F16l 25/00
U.S. Cl. 285—334.4 3 Claims



1. A slitted internal conductor male tubular member for HF coaxial plug connections between two internal conductor tubes of predetermined outer diameter and inner diameter, comprising a central annular support collar, a pair of tubular sleeve portions of the same construction extending oppositely along a common center axis from the support collar; each sleeve portion including an end section to be inserted into the adjacent internal conductor tube, a cylindrical tubular center section extending toward the associated end section from said support collar and an intermediate section between and integrally joining the center and end sections; said intermediate and end sections having continuous slits extending through the intermediate section and continuing through the end section and the free end thereof defining elongated resilient tabs between the slits to be radially flexed inwardly toward the common axis and assume a generally inwardly converging path converging toward said free end upon insertion of the end section into the adjacent internal conductor tube in such manner as to dispose the end section in contact with the internal conductor tube along a substantially cylindrical path, each sleeve portion having an annular transition shoulder defining a step at the juncture of said end and intermediate sections and the intermediate section having a conically tapered outer surface progressing from a smaller diameter adjacent said center section to a larger diameter at said transition shoulder exceeding the smaller diameter by about the wall thickness of the internal conductor tube, the end section being cylindrically formed along its major length with a diameter slightly greater than the internal diameter of the internal conductor tube by a predetermined amount to cause inward

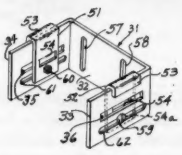
flexing of the tabs in said end section to a sufficient extent to stress said intermediate section into a cylindrical shape conforming the external surface thereof to the diameter of the external surface of the internal conductor tube.

3,860,276

SAFETY LATCH MECHANISMS

Robert E. Lambrecht, 409 Snow Ave., Sugar Grove, Ill. 60554

Filed May 3, 1973, Ser. No. 357,006
Int. Cl. E05c *1/12*
U.S. Cl. 292—169 **3 Claims**



1. A casingless safety latch assembly adaptable for mounting on a closure means which includes two separate closure members, said assembly comprising:

manually rotatably shaft means including a grasping portion and an operating portion of a given length for extending through a bore in a first closure member, with said grasping portion being on one side of said first closure member and said operating portion being on an opposite side thereof;

support means for mounting on said opposite side of the first closure member in close proximity to said operating shaft portion;

said support means comprising a U-shaped member having a pair of longitudinally spaced-apart legs and a base wall of substantial width integrally joining said legs to one another;

said base wall having a plurality of spaced slots therein extending crosswise of the width of the base wall and through which slots fasteners extend for mounting said support means onto the first closure member in adjustable relation lengthwise of the slots;

said legs each including a slot extending lengthwise of the leg for receiving and slidably supporting a latch bar and permitting adjustment of the latch bar along the leg slots; a latch bar of a length sufficient to extend between said operating shaft portion and an edge of a second closure member, said latch bar being slidably mounted in the leg slots of said support means;

rollback means connected to said shaft portion and engaging an adjacent end portion of said latch bar for reciprocally moving said bar in said leg slots on rotation of said shaft means; and

spring means mounted between said support means and said latch bar for biasing said latch bar toward the edge of said second closure member.

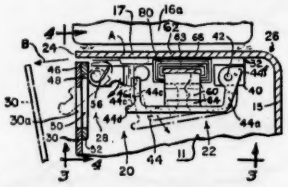
3,860,277

LATCHING ASSEMBLY WITH MAGNETIC LOCKING

William S. Wang, Marina Del Rey, Calif., assignor to Consolidated Controls Corporation, Bethel, Conn.

Continuation of Ser. No. 3,132, Jan. 15, 1970, Pat. No. 3,658,370. This application Feb. 11, 1972, Ser. No. 225,598The portion of the term of this patent subsequent to Apr. 25, 1989, has been disclaimed.
Int. Cl. E05c *19/16*
U.S. Cl. 292—251.5 **13 Claims**

1. A latching assembly for a door swingable toward and away from a doorjamb, said latching assembly comprising a pair of mechanically engageable latch means mounted on said door and jamb, respectively, and movable relatively between an engaged, latched position and a disengaged, unlatched position, permanent magnet means for retaining mechanically latched engagement between said pair of said latch means in said latched position, electromagnet means having a polarity while energized opposing said permanent magnet means for



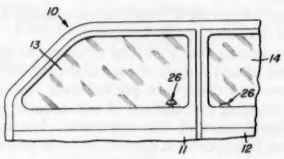
overcoming the retaining force thereof permitting relative movement between said pair of said latch means to said unlatched position so that said door can be opened, one of said pair of said latch means including a pair of relatively movable members, said permanent magnet means mounted on one of said members and said electromagnet means mounted on the other of said members.

3,860,278

THIEF-PROOF DOOR PULL FOR AUTOMOBILES

John F. Dalia, 1517 Empire Blvd., Webster, N.Y. 14580

Filed Apr. 9, 1973, Ser. No. 348,994
Int. Cl. E05c *19/00*
U.S. Cl. 292—347 **2 Claims**



1. In an automotive vehicle door which has a window pane, a frame around said pane including a sill at the bottom of said frame, a latch for locking the door, and a vertically reciprocable pull rod for operating the latch,

a head rigidly secured to said rod so that when said head is gripped and pulled upwardly, said rod is lifted to release the latch and when said head is pushed down said rod is lowered to move the latch to locking position, said head having a bottom surface which conforms in configuration to the upper surface of said sill so that when said rod is lowered to locking position at least the bottom edge surface area of said head contacts and is contiguous to the upper surface of said sill and is flush with the same over substantially the whole of the area of said bottom edge surface, and

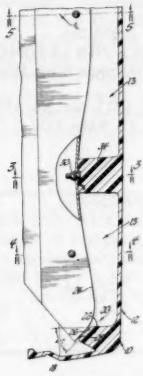
said head having a smooth, arcuate projection-free top surface which extends smoothly from one bottom edge area to corresponding opposite edge area and has a smooth juncture at each of its opposite ends with opposite ends of said bottom edge surface, and said head having substantially parallel sides joining at right angles with said bottom surface thereby to leave no projections between said head and said sill, when said rod is in locking position, under which a tool can be inserted from the outside of the vehicle to raise said head and unlock said door.

3,860,279

RESILIENT ENERGY ABSORBING BUMPER ASSEMBLY

Richard E. Hulten, Durham, N.H., assignor to McCord Corporation, Detroit, Mich.

Filed Jan. 15, 1973, Ser. No. 323,465
Int. Cl. B32b *3/30, 5/18;* B60r *19/08*
U.S. Cl. 293—72 9 Claims



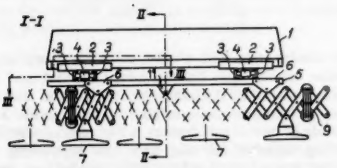
1. An energy absorbing bumper assembly comprising: bumper means for receiving an impact and including an elongated shell member and an elongated support member; energy absorbing means between said shell member and said support member; said energy absorbing means including a block of energy absorbing material between said shell member and said support member, said support member having a first surface thereon and said block having a coacting second surface immediately adjacent thereto, said first and second surfaces being disposed generally at an acute angle relative to the direction of elongation of said members, said second surface being forced against said first surface when said shell member receives an impact generally perpendicular to said surfaces to maximize the energy absorption by said block, said second surface being movable relative to said first surface in response to an impact which is other than perpendicular to said surfaces to reduce the energy absorbed by said block.

3,860,280

GRAB MEANS FOR A NUMBER OF LOAD UNITS

Signar Karlsson, Sundsvall, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Jan. 12, 1973, Ser. No. 323,275
Claims priority, application Sweden, Jan. 18, 1972, 537/72
Int. Cl. B66c *1/00*
U.S. Cl. 294—87 R 5 Claims



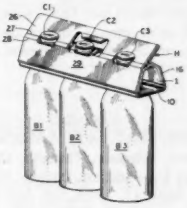
1. Grab means having a plurality of horizontally adjustable grasping members (7) for handling a corresponding number of load units comprising two parallel longitudinal supporting elements extending in the longitudinal direction of the grab means, a pair of parallel cross beams fixed with respect to each other, means supporting the supporting elements on the cross beams for movement towards and from each other, extensible means, means connecting each of the extensible means to one of the supporting elements at at least three spaced points, said extensible means carrying said grasping members, and means operatively connected to said extensible means to expand and contract said extensible means, said extensible means comprising a set of first pantograph-like links, and the connecting means comprising at least two members slidable on each of the supporting elements and a third member fixed on each supporting element.

3,860,281

CARRIER FOR FLANGED ARTICLES

Prentice J. Wood, Jonesboro, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed July 30, 1973, Ser. No. 383,613
Int. Cl. B65d *71/00*
U.S. Cl. 294—87.2 4 Claims



1. A carrier for an elongated flanged article comprising an elongated tubular structure having foldably joined top, bottom and side walls, said top and bottom walls having aligned apertures for receiving a part of the article in such manner that the flange is disposed immediately above said top wall to provide support for the article, a pair of handle panels immediately adjacent one pair of side walls which overlie a second pair of sidewalls respectively, said handle panels extending upwardly therefrom, a fold line formed in at least one of said handle panels in spaced relation to the bottom edge of said one handle panel to facilitate sidewise folding thereof into a position below the top of the article to accommodate stacking of one carrier atop another carrier, an aperture formed in each of said handle panels adjacent the aperture in said top wall for receiving the adjacent end of a packaged article and facilitating the sidewise folding thereof, the lower portions of said handle panels and the side walls being tapered inwardly to facilitate tightening of said apertures formed in said top wall and in said handle panels around said flange when upward pressure is applied to said handle panels, and wherein the transverse dimension of said top wall is less than the diameter of the flange.

3,860,282

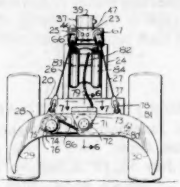
LOG SKIDDER GRAPPLE

Norman Allen Johnson, 5325 10th Ave., Delta, British Columbia, Canada

Filed Jan. 7, 1971, Ser. No. 104,615
Int. Cl. B66c *3/12*
U.S. Cl. 294—112 1 Claim

1. In an apparatus for skidding logs, a manipulating boom means, a first fairlead means operatively mounted in said manipulating boom means, a grapple means comprising a pair of jaws having upper and lower end-portions, a jaw pivot pin interconnecting said upper end-portions for scissors-like relative motion of said jaws, a plurality of opening members, at least one of said opening members operatively connected at one end to each of said jaws intermediate said upper and lower end-portions, the other ends of said opening members interconnected to said manipulating boom means, jaw reeving

means mounted on at least one of said jaws intermediate said upper and lower end-portions, cable means entrained about said jaw pivot pin and further entrained about said jaw reeving means and interconnected to one of said jaws, a second fairlead means operatively mounted on said grapple means, said cable means passing through said first and second fairlead



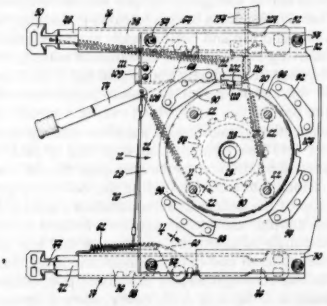
means, said first and second fairlead means adapted for compressive interaction when said cable means brings said first and second fairlead means into face-to-face relation, whereby taking in of said cable means causes said grapple means to close and paying out of said cable means causes said grapple means to open.

3,860,283

SWIVEL SEAT LATCH MECHANISM

Albert J. Colautti, Windsor, Ontario, Canada, assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 17, 1973, Ser. No. 397,850
Int. Cl. B60n *1/04*
U.S. Cl. 296—65 R **2 Claims**



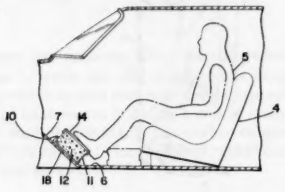
1. In combination with a vehicle having a door located along one side thereof and a floor adapted to support a seat adjacent the door, an adjuster mechanism interposed between the seat and the floor for supporting the seat for rotary movement about a vertical axis between a first position wherein the seat faces forwardly and a second position wherein the seat faces the door, said adjuster mechanism comprising: a base member secured to the floor, a disc-shaped member attached to the seat, means mounting the disc-shaped member on the base member for rotational movement about a vertical axis, bearing means between the base member and the disc-shaped member for providing substantially frictionless rotational movement of the disc-shaped member relative the base member, at least one notch in the peripheral edge of the disc-shaped member, a locking bar having one end fixedly attached to the base member and cantilevered therefrom generally longitudinally of the vehicle, the other end of the locking bar having an upstanding projection engageable in the notch of the disc-shaped member when the lock bar is in its normal unflexed position to prevent rotation of the disc-shaped member relative the base member, an arm projecting laterally of the cantilevered locking bar, an operating lever generally coplanar of the arm and having a depending leg, first pivot means pivotally mounting the depending leg of the operating lever to the base member, and second pivot means connecting the laterally extending arm with the operating lever so that when the operating lever is pivoted about the first pivot means the cantilevered locking bar is flexed laterally and the upstanding projection thereof is moved out of engagement with the notch to permit rotary movement of the vehicle seat.

3,860,284

SAFETY DEVICE FOR AUTOMOBILES

Sanford Lichtig, 20600 Fairmount Blvd., Shaker Heights, Ohio 44118

Filed Mar. 2, 1973, Ser. No. 337,632
Int. Cl. B60n *3/06*
U.S. Cl. 296—75 **2 Claims**



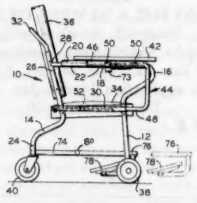
1. A safety device of the character described, comprising a rectangular monolithic block of compressible foamed material adapted to be positioned forwardly of the passenger's front seat in an automobile, and to be compressed by the legs of the passenger when the car comes to a stop, whereby to cushion the impact of the stop, said block having densified portions adjacent the top, bottom, front and rear surfaces of the block, said densified portions having corrugations extending longitudinally of the block.

3,860,285

COMBINED WHEELCHAIR, TRAY AND FOOT REST

De Witt B. Hartman, Archbold, Ohio, assignor to Gendron-Diemer, Inc., Archbold, Ohio

Filed Jan. 29, 1973, Ser. No. 327,853
Int. Cl. A47c *7/62*
U.S. Cl. 297—150 **2 Claims**



1. In combination with a chair structure comprising a pair of similar tubular side frames joined by seat and backrest members each of said frames including front and rear leg portions and an armrest; a tubular frame member affixed to the outside of one of said frames; a tray; a generally U-shaped supporting member for said tray, said supporting member having two spaced apart substantially parallel legs, one of said legs being pivotally secured to the undersurface of said tray, the other of said legs being hollow and telescopingly received by said tubular frame member, said legs being spaced apart a distance substantially the same as the distance between said tubular frame member and the upper surface of the armrest on the one of said frames to which said tubular member is attached; and bracket means for selectively fastening the under-

surface of the opposite edge of said tray in the position of use to the armrest of the other of said frames and in the stored position to the armrest portion of the one of said frames to which said tubular member is attached, the improvement which comprises:

means interconnecting said tubular member and the other of said legs to permit relative rotational movement therebetween and limited relative longitudinal movement and prevent disassociation therebetween to militate against the removal of said tray from the chair including a rod having one end affixed to said tubular frame member, said other leg having a reduced opening in the end thereof, the other end of said rod fitted through the opening in said leg, and stop means on said other end of said rod providing a limit to the relative longitudinal movement between said tubular frame member and said other leg.

3,860,286

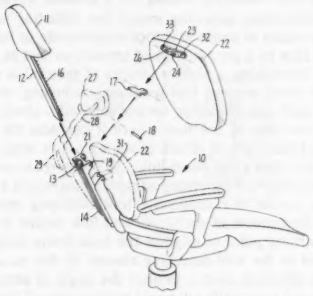
SPLIT BACK DENTAL CHAIR APPARATUS

Keith O. Rasmussen, San Francisco, Calif., assignor to Hek Manufacturing Company, Inc., San Francisco, Calif.

Filed July 27, 1973, Ser. No. 383,452

Int. Cl. A47c *7/36*

U.S. Cl. 297—408 **4 Claims**



1. A thin profile split back conversion for a dental chair having a keyway in its frame for slidably suppporting an articulated headrest and a pin mount for pivotally supporting a backrest, comprising

an elongated back support member formed for slidable mounting in the chair frame keyway and having a headrest keyway formed therein and pin mounting means at the upper end thereof,

a thin profile backrest pivotally mounted on said pin mounting means on said back support member,

a thin profile headrest having an elongated tongue slidable in said keyway in said support member,

and securing means on said support member and said tongue formed for adjustably retaining said headrest in desired position relative to said backrest.

3,860,287

SEATING CONSTRUCTION

Frederick C. Platt, Rochester, Mich., assignor to Flex-o-Lators, Inc., Carthage, Mo.

Filed Aug. 28, 1972, Ser. No. 284,228

Int. Cl. A47c *27/14, 27/22*

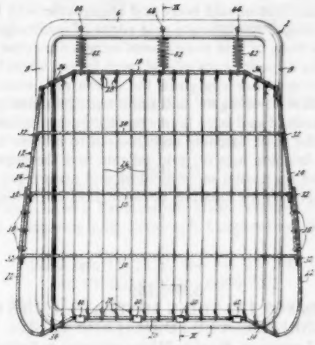
U.S. Cl. 297—452 **3 Claims**

1. A seating construction for use in combination with a rigid, generally rectangular frame having front, rear and side rails, said construction comprising:

a. a generally rectangular deck member adapted to overlie said frame with its rearward edge spaced forwardly from the rear rail of said frame, and comprising a generally planar sheet of resilient material having a generally horizontal central portion and with its lateral edge portions angled upwardly and outwardly to form wings,

b. means for attaching the forward edge of the central portion of said deck member unyieldingly to the front rail of said frame, and

c. forwardly and downwardly yieldable resilient means for attaching the rearward edge of the horizontal central



portion of said deck member to the rear rail of said frame, whereby when said deck is top-loaded at the rearward central portion thereof, the rearward edge of the central portion portion of the deck member will be deflected downwardly to cause a general downward tilting of the deck to the rear, and will be downwardly bowed intermediate its ends to cause at least the rearward portions of said deck wing members to pivot inwardly toward a vertical position.

3,860,288

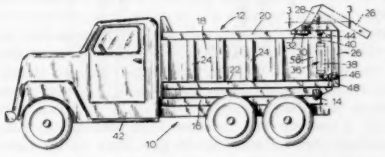
DUMP TRUCK TAILGATE ACTUATOR

Leon Z. Martin, Ephrata, and Benjamin Z. Weaver, New Holland, both of Pa., assignors to Burkholder Paving, Inc., Ephrata, Pa.

Filed Apr. 11, 1973, Ser. No. 350,047

Int. Cl. B60p *1/26*

U.S. Cl. 298—23 MD **4 Claims**



1. A dump truck body having similar sides extending perpendicularly upward from opposite side edges of the bed of the body and the rear end of said body being open, in combination with a tailgate and operating and latching mechanism therefor, said tailgate having arms connected at one end to and extending substantially perpendicularly from the tailgate at the opposite upper courses thereof, means pivotally connecting the opposite ends of said arms respectively to the upper edges of the opposite sides of said body at locations spaced from the rear ends of said sides a substantial distance, a pair of fluid-actuated cylinder and piston power units mounted adjacent the opposite sides of said body and pivotally connected to said arms on said tailgate in spaced relation to the pivoted ends thereof and operable to elevate said tailgate to open position from closed position by moving said arms

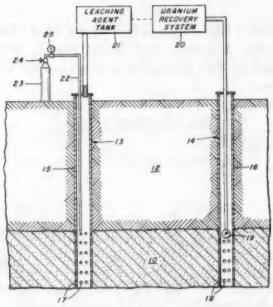
upwardly from the pivoted ends thereof and thereby moving said tailgate outward from said rear end of said body and upwardly to dispose said tailgate entirely disengaged and spaced from the rear ends of the sides of said body and thereby render the rear end of said body free from obstruction by said tailgate when the latter is in said open position thereof, latch levers respectively pivotally connected intermediately of the ends thereof to the sides of said body adjacent the lower edges and outer ends thereof, the outer ends of said latch levers comprising latching ends extending beyond the outer ends of said sides of said body and engageable with latching lugs extending from opposite side edges of said tailgate, and one end of each of said power units being connected respectively to the opposite ends of said latch levers, whereby when said power units are energized the piston rods extend from said cylinders to elongate said units and simultaneously depress the ends of said latch levers to which they are connected and raise the outer latching ends thereof to release the same from said latching lugs on said tailgate and thereupon raise said tailgate by pivotal movement of said arms thereon, said power units thereby floating between said latch levers and arms.

3,860,289

PROCESS FOR LEACHING MINERAL VALUES FROM UNDERGROUND FORMATIONS IN SITU

Robert P. Learmont, Warba, Minn., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 26, 1972, Ser. No. 300,956
Int. Cl. E21b *43/28*
U.S. Cl. 299—4 **2 Claims**



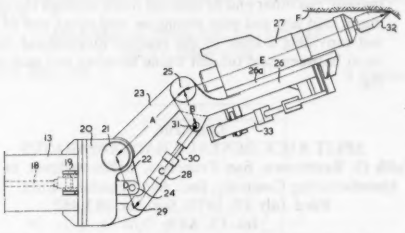
1. In a process for leaching mineral values from an underground formation in situ in which an oxygenated aqueous solution of a leaching agent is delivered to the formation through an injection well, the solution remains in contact with the formation for a prolonged period, and the pregnant solution with mineral values dissolved therein is pumped from the formation for recovery of said values, an improved method of xoygenating oxygenating solution, said method comprising introducing oxygen from a source at the surface down said injection well at a submergence of **100** to **300** feet, where it enters the solution under a pressure of the head of solution thereabove.

3,860,290

MINING, ROCK BREAKING, EXCAVATING MACHINE AND IMPLEMENT

Henry Mappin, Ashton-in-Makerfield, England, assignor to Dobson Park Industries Limited, Nottingham, Nottinghamshire, England

Filed Aug. 10, 1973, Ser. No. 387,505
Claims priority, application Great Britain, Aug. 12, 1972, 37681/72
Int. Cl. E21c *27/46*
U.S. Cl. 299—32 **9 Claims**



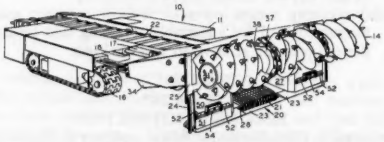
1. A mineral working machine or implement comprising an adjustable tool-mounting means for a mineral working tool, first tool-mounting adjusting means for adjusting said tool-mounting means to cause said tool to penetrate or be set into a mineral face by a predetermined amount so that as said tool is moved therealong a web or lamina of mineral is removed from said face, second tool-mounting adjusting means for adjusting said tool-mounting means angularly, about a working point or edge of the tool where it contacts the mineral face, to set the angle of attack of the tool with respect to the mineral face, and a lever-and-link means interconnecting said first and second tool-mounting adjusting means and a member of which carries the adjustable tool-mounting means, the effective dimensions of said lever-and-link means in relation to said working point or edge of the tool, being such that an adjustment of the tool-mounting means, by the second tool-mounting adjusting means, to alter the angle of attack of the tool, does not materially alter said predetermined penetration or setting of the tool into the mineral face.

3,860,291

CONTINUOUS CUTTING AND GATHERING APPARATUS FOR A CONTINUOUS MINING MACHINE

Glenn A. Rauch, Westerville, and Robert E. Hess, Columbus, both of Ohio, assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 5, 1973, Ser. No. 412,715
Int. Cl. E21c *27/24, 35/20*
U.S. Cl. 299—67 **6 Claims**



1. A mining machine, comprising:
a frame mounted for movement toward a mine face;
a mining head mounted on the forward end of the frame, the mining head including a shaft mounted for rotation at the forward end of the mining head and disposed transverse to the direction of movement of the frame;
a plurality of helical cutter members mounted about the rotatable shaft, the helical cutters being shaped to direct mined material along the axis of the shaft;

a back up panel mounted on the mining head just rearward of the periphery of the helical cutters and substantially parallel thereto to provide a surface against which the helical cutter members may move the mined material; and

a gathering structure mounted at the forward end of the frame beneath the mining head including a gathering conveyor throat having a conveyor mounted therein for rearward movement of mined material fed to it; and

a substantially vertical dozer blade disposed to one side of the conveyor throat just rearward of the periphery of the helical cutters and substantially parallel thereto, an upper portion of the dozer blade being pivotable about hinged structures provided at its lower edge, the dozer blade having means tending to pivot the upper portion about the hinged edge to maintain the upper portion in contact with the back up panel.

3,860,292

ROCK BORING CUTTER WITH INTERNAL VIBRATOR

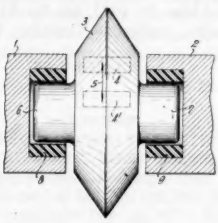
Karl Gunther Bechem, Berchum, Germany, assignor to J. C. Soding & Halbach, Hagen/Westfalen, Germany

Filed Nov. 28, 1972, Ser. No. 309,958

Claims priority, application Germany, Nov. 30, 1971, 2159351

Int. Cl. E21c *37/20*

U.S. Cl. 299—86 **9 Claims**



1. A rock boring device comprising a roller holder, a cutting ridge equipped roller arranged to rotate about an axis for cutting rock, a support element and bearing means carrying the roller on said support element and arranged on at least one side of a plane perpendicular to the axis and passing through the roller, said bearing means being of an elastic material for damping the transmission of radial movement of the roller to said support means and a rotary bob weight vibrator arranged inside the roller and carried in the frame so that relative radially directed movement which is resiliently opposed can take place.

3,860,293

SKATE WHEEL

Robert J. Labeda, 6040 Indiana, Buena Park, Calif. 90621

Filed Sept. 17, 1973, Ser. No. 398,300

Int. Cl. A63c *17/22*

U.S. Cl. 301—5.7 **6 Claims**

1. An assembly comprising:

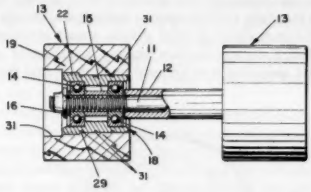
a metallic hub, and

a nonmetallic tire surrounding said hub and fixed thereto; said hub having a cylindrical outer surface and a circular bore;

said tire having a cylindrical outer surface and a cylindrical bore coaxially disposed;

the shape of said bore in said hub being such that oppositely disposed shoulders are formed equally distant from the respective ends wherein the diameter of said bore is greater nearer the ends than at the center;

said hub having two internal conical surfaces formed one at each end of said bore of said hub and said internal conical surfaces being axially aligned to allow machining said tire



in a lathe thereby making the tire cylindrical and coaxial with the axis of rotation.

3,860,294

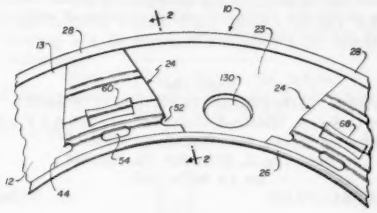
TRIM RING AND METHOD OF PRODUCING SAME

Leslie Floyd Jacobs, Farmington, Mich., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 13, 1972, Ser. No. 217,545

Int. Cl. B21d *53/26*; **B60b** *7/02*

U.S. Cl. 301—37 R **3 Claims**



1. A trim ring adapted to be secured to a generally annular flanged wheel rim, the contour of the wheel rim having an axially outer, radial wall terminating at a shoulder leading to an axially inwardly directed wall, said last-mentioned wall leading to an angled interface with the generally planar rim body, and comprising a rigid decorative member adapted to rest within a central annulus of the wheel rim, said trim ring comprising an annular wall, annular inturned flanges at the axial extremities of said trim ring wall facing toward the adjacent wheel rim, a plurality of clip members angularly spaced about said annular wall member, each of said clip members having the ends thereof captured and held firmly within said flanges to bow an intermediate portion of each of said clip members toward the adjacent wheel rim, said intermediate portion including a plurality of stepped surfaces generally parallel to the contoured walls of said rim and a toothed member on an axial wall of said intermediate portion for engaging and gripping the adjacent axial wall wheel rim.

3,860,295

WHEEL TRIM [AND METHOD]

Hans R. Beisch, Amherstburg, Ontario, Canada, assignor to Norris Industries, Inc., Los Angeles, Calif.

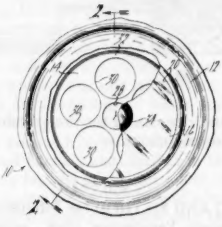
Filed Sept. 27, 1972, Ser. No. 292,547

Int. Cl. B60b *7/00*

U.S. Cl. 301—37 CM **6 Claims**

1. Wheel trim for a vehicle wheel, comprising: a sheet metal cover member adapted to cover a portion of a wheel; means defining a generally circular seat on said cover member; a resilient gasket disposed on said seat and having an annular periphery whose overall diameter is slightly less than the diameter of said seat; a plastic insert member disposed on said

gasket, said plastic insert member having a rear face engaging said gasket, a front face opposite said rear face and a free peripheral edge surface disposed therebetween; and annular retention flange means on said cover member having a generally axially extending surface spaced radially outwardly of said peripheral edge surface of said plastic insert member, said retention flange means further having a retaining surface overlying and engaging a peripheral portion of said front face



of said plastic insert member, said retention flange means permitting relative radial displacement of said insert member on said seat, the spacing between said peripheral edge surface and said axially extending surface of said retention flange means being such that said plastic insert member is retained in a substantially unstressed condition in the radial direction in spite of thermal expansion and contraction of said cover member and said insert member.

3,860,296

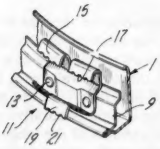
WHEEL TRIM FOR DIFFERENT SIZE WHEELS

Edward G. Spisak, Westland, Mich., assignor to S & S Product Engineering Service, Inc., Wyandotte, Mich.

Filed Aug. 2, 1973, Ser. No. 386,448

Int. Cl. B60b *7/00*

U.S. Cl. 301—37 CD **7 Claims**



1. Wheel trim for installation on different vehicle wheels each having a different locating surface comprising a plurality of fastener means for attaching the wheel trim either to a first wheel or to a second and different wheel, said fastener means having a first wheel engaging and gripping means adapted to engage a locating surface on the first wheel and a second wheel engaging and gripping means adapted to engage a different locating surface on the second wheel whereby said wheel trim may be secured to either said first or said second wheels.

3,860,297

VEHICLE WHEEL ACCESSORY MOUNTING FIXTURE AND REMOVABLE ACCESSORIES THEREFOR

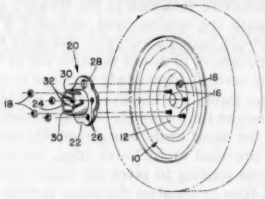
Cruz Luevano Solis, 1204 Buena Vista, San Antonio, Tex. 78207

Filed Feb. 5, 1973, Ser. No. 329,442

Int. Cl. B60b *11/00*

U.S. Cl. 301—38 R **4 Claims**

1. A wheel accessory mounting fixture for removably securing wheel accessories to a vehicle wheel, said mounting fixture comprising a mounting plate having a plurality of bores formed therethrough in a pattern adapted to conform to the lug pattern of an associated wheel, all but one of said bores being of a predetermined small diameter and said one bore being of a larger diameter, the small diameter bores being adapted to receive conventional wheel mounting lugs there-



through and the larger diameter bore being adapted to receive a conventional wheel mounting lug nut therethrough, said plate, in the central area of said pattern, including wheel accessory mounting structure projecting outwardly therefrom and adapted to have a wheel accessory removably supported therefrom.

3,860,298

ELECTRICAL ANTISKID DEVICE FOR VEHICLES

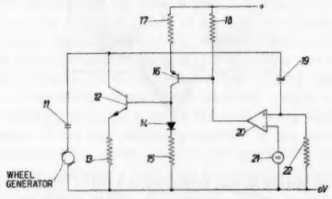
Wolfgang Erath, Munich, Germany, assignor to Knorr-Bremse GmbH, Munich, Germany

Filed Mar. 21, 1973, Ser. No. 343,476

Claims priority, application Germany, Mar. 22, 1972, 2213845

Int. Cl. B60t *8/08*

U.S. Cl. 303—21 BE **1 Claim**



1. In an electrical antiskid device for railway vehicles and other vehicles, the combination of means for generating a voltage proportional to the rotary speed of an axle of a vehicle, a capacitor charged by said generated voltage and discharging a voltage produced by a discharge with regulated constant current for comparison to said generated voltage, a differentiating element connected to said capacitor to differentiate the discharge voltage therefrom, a difference amplifier having inputs connected to a reference voltage source and to said differentiating element, a second transistor having its base connected to the output of said difference amplifier, and a discharge transistor and an emitter resistor connected thereto through which said capacitor is discharged and having a collector connected to said capacitor and to said differentiating element to regulate the discharge current of said capacitor in opposition to any deviation of the differential voltage from the reference voltage.

3,860,299

ENDLESS TRACK FOR VEHICLE

Donald L. Schaffner, Springfield, Ill., assignor to Fiat - Allis Construction Machinery, Inc., Milwaukee, Wis.

Filed Dec. 1, 1972, Ser. No. 311,338

Int. Cl. B62d *55/20*

U.S. Cl. 305—57 **6 Claims**

1. A section of an endless track for a crawler tractor comprising:

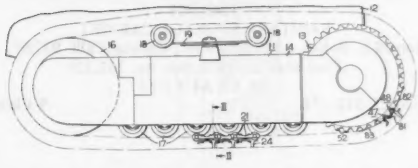
a pair of transversely spaced parallel links adapted to longitudinally opposite ends for pivotal connection on parallel axes to complementary links, and

a shoe structure extending transversely between and having its opposite transverse ends disposed below and releasably secured to said links, respectively, said shoe structure including

a ground engaging part on the bottom side thereof,

a pair of longitudinally spaced sprocket engaging drive lugs on the top central portion thereof,

a pair of longitudinally extending guide rails adjacent transversely opposite sides of said drive lugs, and



a pair of flat roller engaging surfaces on the top side thereof between said guide rails and links, respectively,

said drive lugs and guide rails defining a pocket adapted to receive a first tooth of a drive sprocket without contact with said first tooth, one and not the other of said drive lugs being engaged by a second tooth of a drive sprocket during forward propulsion of said tractor and the other and not said one drive lug being engaged by a third tooth of a drive sprocket during reverse operation of said tractor.

3,860,300

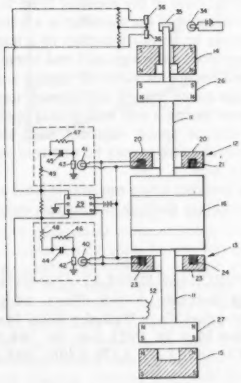
VIRTUALLY ZERO POWERED MAGNETIC SUSPENSION

Joseph Lyman, Kennebunk, Maine, assignor to Cambridge Thermionic Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 160,384, July 7, 1971, abandoned. This application Dec. 20, 1972, Ser. No. 317,047

Int. Cl. F16c *39/06*

U.S. Cl. 308—10 **5 Claims**



1. Magnetic suspension apparatus for stable support of a movable object without heavy power requirements, comprising:

a movable object having a longitudinal axis;

first and second permanent magnet means for exerting opposing forces on said movable object, said forces being substantially equal and opposite when said movable object is in an initial neutral position and becoming unequal as said movable object moves in the direction of said longitudinal axis toward one of said permanent magnet means and away from the other permanent magnet means under the influence of a persisting displacing force;

electromagnet force applying means for selectively exerting an electrically controllable additional force on said movable object in a first direction along said longitudinal axis or the opposite direction;

servo means including a rate sensing pick up and amplifying means responsive thereto for energizing said electromagnetic force applying means to provide a force greater than the persisting displacing force and the resultant additional net force exerted by the first and second permanent magnet means as the result of the movable object being displaced by the persisting displacing force; and

means initially responding to a persisting net energization of the electromagnetic force applying means for biasing said servo means to move said movable object back through said initial neutral position to an oppositely displaced position to impose substantially upon the permanent magnet means the burden of sustaining the movable object and relegating the electromagnetic force applying means to the imparting of stabiizing forces.

3,860,301

ROLLING BEARING WITH SHEET METAL RINGS AND TWO ROWS OF ROLLING BODIES

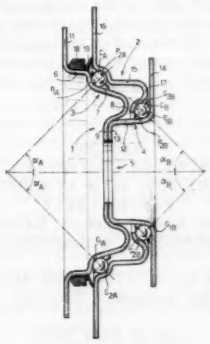
Giorgio Zerbola, Torino, Italy, assignor to SKF Industrial Trading and Development Company B.V., Amsterdam, Netherlands

Filed May 31, 1973, Ser. No. 365,667

Claims priority, application Italy, July 6, 1972, 69171/72

Int. Cl. F16c *19/00*

U.S. Cl. 308—183 **4 Claims**



1. A rolling bearing comprising:

a first and a second coaxial element rotatable one with respect to the other and provided with rolling races;

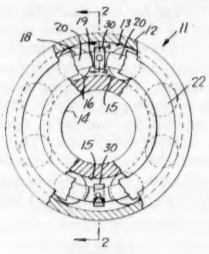
two rows of rolling bodies which roll in said rolling races, the rolling bodies of one row being located at an axial distance from the rolling bodies of the other row of greater than 20 percent of the diameter of one rolling body of the rows and the normals at the points of contact of each of the rolling races with the relative rolling bodies pertaining to one conical surface the vertex of which is located on the opposite side of the vertex of the other conical surface with respect to a plane normal to the axis of the bearing;

said first rotatable element consisting of two rings of sheet metal joined together on each of which is formed a rolling race for said rolling bodies;

said second rotatable element being formed from a single ring of sheet metal on which two rolling races for said

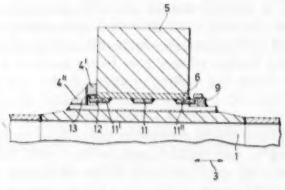
rolling bodies are formed, and one of said two rolling races of the second rotatable element being formed on an annular part of the second element which is bent inside of a central substantially cylindrical part of the element.

3,860,302
BALL BEARING ASSEMBLY
Woodrow W. Gregg, 181 Long Hill Rd., Little Falls, N.J. 07424
Filed June 29, 1973, Ser. No. 375,129
Int. Cl. F16c *1/24*
U.S. Cl. 308—187 **15 Claims**



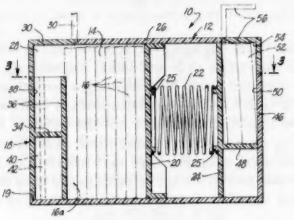
1. A bearing assembly comprising an outer raceway body having an inwardly facing annular raceway groove, an inner raceway body concentrically disposed in said outer body and having an outwardly spacing annular raceway groove, a plurality of rotatable bearing elements in said groove, a spacer member concentrically disposed between the bodies and having circumferentially spaced holding means surrounding the bearing elements and holding them in circumferentially spaced relationship, annular sealing elements between the bodies on opposite sides of the spacer member, lubricating material in the space defined between said sealing elements, and at least one arm mounted on the spacer member defining a lateral projection engaged with said lubricating material and retarding rotation of said spacer member relative to the bodies.

3,860,303
DEVICE FOR SECURING A RACEWAY TO THE CASING OF A ROTARY TUBE SUCH AS A ROTARY KILN, PARTICULARLY
Herbert Deussner, Bensberg-Refrath, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Koln, Germany
Filed Apr. 9, 1973, Ser. No. 349,239
Claims priority, application Germany, Apr. 8, 1972, 2216982
Int. Cl. F16c *13/00*
U.S. Cl. 308—204 **8 Claims**



1. In combination, a rotary tube having an outer casing, a race having an inner diameter that is greater than the outer diameter of said rotary tube casing at a location thereof at which said race is to be secured onto said casing, so that an intermediate space is formed between said race and said casing at said location, a multiplicity of liner plates releasably received in said intermediate space and substantially uniformly distributed on the periphery of said casing so as to secure said race on said casing, and race shoes secured to said rotary tube casing, each of said liner plates resting upon at least one of said race shoes, each of said race shoes being longer than the width of said races, and consequently having a projecting end, said projecting end, respectively, being broken off stepwise, the edge of the step being disposed, respectively, in an elongation of the lateral surface of said race and, in axial direction, forming an abutment surface for said bracing means.

3,860,304
SANITARY STORAGE CABINET
Ronald L. Bolton, 1059 Driftwood, Corona, Calif. 91720
Filed May 21, 1973, Ser. No. 362,321
Int. Cl. A47f *1/12*
U.S. Cl. 312—71 **9 Claims**

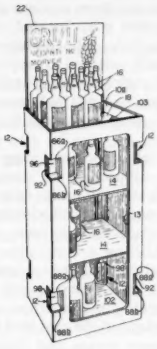


1. A sanitary cabinet for storing and dispensing feminine sanitary napkins comprising:
an elongate storage container having an interior storage space opening through one end of said container for containing a stack of sanitary napkins arranged side by side in a row extending endwise of the container,
an end closure member closing the end opening of said container,
means slidably mounting said closure member on said container for removal of the member from the container by sliding movement of the member in a transverse plane of the container to permit insertion of a napkin stack into said storage space through said end opening,
spring loaded means for yieldably urging a napkin stack in said storage space toward said closure member,
said container having a side wall access opening to the end of said storage space adjacent said closure member through which napkins may be removed one by one from said space, and
said closure member being removable from and replaceable in said container through said access opening.

3,860,305
POINT OF PURCHASE DISPLAY AND STORAGE RACK
Walter George Bergman, Natick, Mass., assignor to Walter George Enterprises, Inc., Wellesley Hills, Mass.
Filed May 29, 1973, Ser. No. 364,887
Int. Cl. A47f *3/00;* **A47b** *47/06;* **B65d** *5/02*
U.S. Cl. 312—114 **11 Claims**

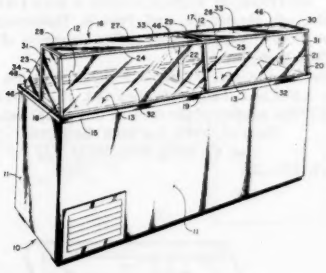
1. A point of purchase storage and display rack comprising
A. a tube made of relatively stiff sheet material,
B. a window in the tube,
C. a plurality of legs distributed around the tube, each said leg
1. being relatively rigid, and
2. extending substantially the entire length of the tube,
D. at least one support member secured to each leg, each such member

1. projecting toward the longitudinal axis of the tube, and
2. defining with corresponding members on the other



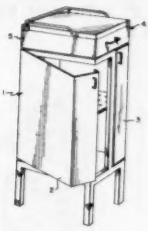
legs one or more horizontal planes within the tube, and
E. means for securing each leg to the tube wall.

3,860,306
REFRIGERATED CABINET CANOPY
Andre J. Kenyon, Rosemount, Minn., assignor to Schaefer Corporation, Minneapolis, Minn.
Filed Sept. 26, 1973, Ser. No. 400,846
Int. Cl. A47f *3/04*
U.S. Cl. 312—116 **7 Claims**



1. A refrigerated cabinet having a canopy, said cabinet having a plurality of vertical walls attached to define a top opening in said cabinet, said walls having top edges, and said canopy being supported by a frame on said top edges, said frame supporting a front panel, a back panel, a pair of side panels and a top panel of said canopy, at least one of said panels serving as an access door panel and being movably mounted on said frame for movement from a closed position in which said canopy covers said top opening to a fully open position in which said top opening is substantially exposed to the outside environment, and at least one other of said panels having a lower edge normally directly engaging a corresponding top edge of one of said walls, said other panel being slidably mounted in a channel of said frame and being restrained by said frame and channel to limited upward displacement to temporarily separate the lower edge of said slidably mounted panel of said canopy from said top edge of said wall for cleaning said panel and wall edge without substantially opening said cabinet.

3,860,307
BEDSIDE TABLE
Karl Fostel, Martinstr. 10, A 1181 Vienna, Austria
Filed Mar. 12, 1973, Ser. No. 339,989
Int. Cl. A47b *49/00, 88/00*
U.S. Cl. 312—252 **7 Claims**



1. A swivel top table which comprises:
a. a first stationary section which defines a lower storage compartment;
b. door members pivotally mounted on adjacent portions of a rear wall of the first section, said members having open and closed positions and being so configured that when at least one door member is rotated to the open position, access is provided to the inner storage compartment of said first section from a plurality of directions;
c. a second section pivotally mounted to an upper portion of said lower section for rotatable swivel movement with respect thereto;
d. a lower support plate connected to the upper portion of said lower section;
e. an upper support plate supporting said upper section on said lower section;
f. a substantially elongated member connected to said upper support plate and extending through a substantially central opening in said lower support plate, to pivotally support said upper support plate on said lower support plate;
g. bearing means between said upper and lower support plates rotatably suspporting said upper support plate on said lower support plate to thereby provide rotatable swivel movement of said upper swivel section relative to said lower section;
h. a substantially elongated guide member attached to said lower support plate to pivotably support said elongated pivot member with said upper and lower support plates in face-to-face spaced relation;
j. a resilient member received on the free end portion of said elongated pivot member;
k. a locking member received on said free end portion of said elongated pivot member and adapted to adjustably secure said upper and lower sections in assembled relation.
l. a plate member fixed substantially horizontally to the upper portion of said rotatable upper section so as to form a table rotatable with the upper section in a manner such that access to substantially all portions of the upper surface of the table may be provided from one direction by rotating said upper section;
m. a storage receptacle slidably mounted in the upper rotatable section and rotatable therewith such that access is provided to said receptacle from a plurality of directions corresponding to rotated positions of the upper section; and
n. means to fix the upper section in selected rotated positions relative to the lower section such that rotation of said upper section with respect to said lower section facilitates access to the entire upper surface of said table while said lower section is maintained in a stationary

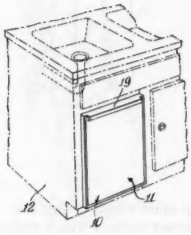
position, thereby providing convenient accessibility to substantially all portions of the table.

3,860,308

SLIDE STRUCTURE FOR REFUSE COMPACTOR

Harry Dennis Burke, Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sept. 4, 1973, Ser. No. 394,331
Int. Cl. A47b *88/04*; F16c *19/00*
U.S. Cl. 312—341 R **17 Claims**



1. In a refuse compactor having a cabinet defining a base and a front opening, compacting means within the cabinet, and a drawer for receiving refuse to be compacted by the compacting means, slide structure for movably mounting the drawer comprising:

a first track mounted to said base to extend longitudinally toward said front opening;

a second track;

means for mounting said drawer to said second track;

a third track;

means for mounting said third track intermediate said first and second tracks whereby said third track is longitudinally movable along said first track and said second track is longitudinally movable along said third track to selectively dispose said drawer in a compacting position within the cabinet with said tracks in a telescoped arrangement and a refuse-receiving position forwardly of said cabinet front opening with said tracks in an extended arrangement; and

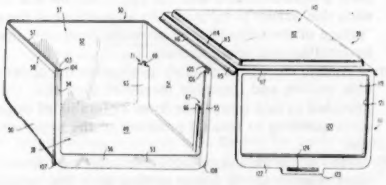
means for causing said drawer to be supported substantially directly by said base as an incident of the disposition of said drawer in said compacting position.

3,860,309

ENCLOSURE STRUCTURE FOR MODULAR SYSTEM

Thomas Brendgord, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.

Division of Ser. No. 278,362, Aug. 7, 1972, Pat. No. 3,791,528. This application Aug. 27, 1973, Ser. No. 391,535
Int. Cl. B65d *21/04*; A47b *87/00*; A47f *5/08*
U.S. Cl. 312—351 **8 Claims**



1. Container module of unitary construction comprising bottom wall means,

rear wall means, and

side wall means,

the bottom, rear, and side wall means defining a generally rectilinear configuration enclosed with full-open access across upper and front portions of the defined enclosure, internal support posts located contiguous to front and rear corners of the defined enclosure, such support posts being vertically oriented to support means for subdividing the defined enclosure horizontally,

the bottom, rear, and side wall means each having an external surface and an internal surface relative to the defined enclosure,

the bottom wall means including means on its external surface for supporting the container module on a flat surface with sidewall means substantially vertical,

the rear wall means including interconnecting means on its external surface for cantilever suspension of the container module on a vertically-oriented support means with sidewall means of the enclosure substantially vertical when the defined enclosure is in its upright position,

the interconnecting means projecting rearwardly from the external surface of the rear wall means, and including

elongated hanger means and stabilizing means predeterminedly positioned on the rear wall means with the elongated hanger means being horizontally-oriented at a location spaced vertically from the stabilizing means,

such location for the hanger means being spaced upwardly from the stabilizing means when the container module is in its upright position,

the elongated hanger means including a downwardly depending flange means spaced from the external surface of the rear wall means by a downwardly facing load support surface,

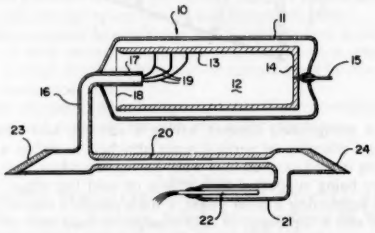
the external surfaces of the rear and side wall means defining planes having a substantially right angled relationship.

3,860,310

METHOD OF FABRICATING A GAS LASER

Urs Hochuli, Hyattsville, and Paul R. Haldemann, College Park, both of Md., assignors to The University of Maryland, College Park, Md.

Continuation-in-part of Ser. No. 579,293, Sept. 14, 1966, Pat. No. 3,614,642. This application Oct. 15, 1971, Ser. No. 189,527The portion of the term of this patent subsequent to Oct. 19, 1988, has been disclaimed.
Int. Cl. H01j *9/00*; H01s *3/22*
U.S. Cl. 316—26 **14 Claims**



1. The method of fabricating a gas laser, said gas laser comprising an extended hollow cylindrical oxide coated cold metallic cathode, an anode and an enclosure for said anode and cathode containing free oxygen, comprising

preparing the inner surface of said cathode to present an uncontaminated surface, and thereafter respectively, for about four cycles of:

outpumping said enclosure and filling with O_2 to a pressure of about 2 Torr,

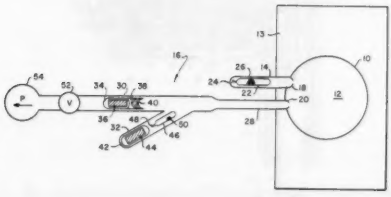
effecting an electrical discharge between said anode and cathode with about 5-10 milliamperes per square centi-

meter over said inner surface, while maintaining said pressure at about 2-3 Torr,
terminating discharge and reducing gas pressure in said enclosure well below 2 Torr,
refilling said enclosure with an oxygen containing gas mixture to about 2 Torr,
restarting said discharge and again outpumping said discharge,
thereafter and upon attainment of stable pressure evacuating said envelope to at least 10^{-6} Torr and further outgassing said anode and cathode, and thereafter repetitively filling the enclosure with a laser gas mixture and restarting and continuing the discharge until the laser gas color turns true to type,
thereafter pumping down to 10^{-6} Torr and refilling with said laser gas, and restarting the discharge, until the discharge becomes and remains the true color representing purity of the laser gas,
thereafter again initiating a discharge of normally running current resulting in a current density of not more than 0.6 mA/cm² of cathode area for up to 1 to 2 days, and
thereafter refilling with the laser gas and sealing.

3,860,311
APPARATUS FOR PRODUCING MAGNETIC RESONANCE CELLS

Donald I. Shernoff, White Plains, and James H. Simpson, Katonah, both of N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 23, 1973, Ser. No. 381,834
Int. Cl. H01j *9/38*
U.S. Cl. 316—30 **6 Claims**

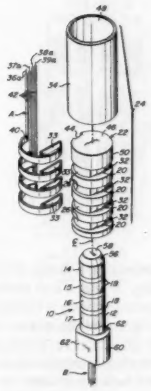


1. An apparatus for making a magnetic resonance cell comprising:
a glass sphere;
at least two tubes connected to said sphere;
a necked-down portion in one of said tubes connected at one of its ends to said sphere;
two tubular branches connected to the other end of said necked-down portion;
vacuum pumping means connected to the otherwise unconnected end of the first of said branches, the second being sealed at its unconnected end;
first carrier means movably contained within the first of said branches for carrying a wax-like material into said necked-down portion, said first carrier means holding a portion of wax-like material;
second carrier means movably contained within the second of said branches for moving an alkali metal into said necked-down portion, said second carrier means holding a portion of alkali metal; and
a getter within said second tube.

3,860,312
ELECTRICAL SLIP COUPLING

Frank Gordon, Jr., Cincinnati, Ohio, assignor to Welco Industries, Inc., Cincinnati, Ohio

Filed June 13, 1973, Ser. No. 369,554
Int. Cl. H01r *39/64*
U.S. Cl. 339—4 **18 Claims**

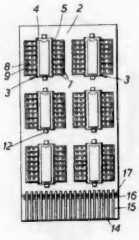


1. An electrical slip coupling including complementary socket and plug elements;
said plug element comprising an elongate member having a plurality of spaced, parallel conductor rings in circumscribing relationship therewith;
said socket element comprising an elongate brush holder having a plug-receptive bore therein;
a plurality of spaced, circumferential brush-receiving channels in the outer surface of said holder wherein a portion of each channel is in open communication with said bore;
a pluraltiy of resilient conductor brushes, one in each of said channels, wherein each brush includes a plug-contact portion which normally and yieldably extends into and beyond the inner surface of the said bore;
an elongate, axially extending, conductor-receptive channel in the periphery of said brush holder intersecting and in open communication with each of said circumferential channels;
means engaging portions of the outer surface of the brush holder and portions of the brushes and conductors received in said circumferential and axial channels securing said brushes and conductors to and against accidental or unintentional displacement from said holder;
the peripheral surface of said plug element and the inner surface of the bore of said socket element providing endwise, longitudinal and free rotary relative motion between said plug and socket elements;
the plug-contacting portion of each of said brushes being disposed in yielding contacting relationship with a conductor ring for providing electrical continuity therewith when the plug element is housed within the socket element.

3,860,313
CIRCUIT BOARD

Graham Rattcliff, South Nutfield, and Ronald Sidney Thomas Kemp, Coulsdon, both of England, assignors to Thomas Jermyn, Sevenoaks, Kent, England

Continuation-in-part of Ser. No. 241,521, April 6, 1972. This application May 17, 1973, Ser. No. 361,167
Claims priority, application Great Britain, June 7, 1972, 26467/72; Apr. 23, 1972, 11079/71
Int. Cl. H01r *13/54*; H05k *1/04*
U.S. Cl. 339—17 C 6 Claims

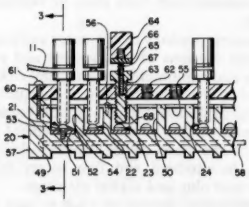


1. A circuit board comprising a body of electric insulating material having a plurality of electrical component receiving locations, each said location having a raised projecting body portion thereat projecting from the plane of the board and provided with a plurality of socket recesses arranged in parallel and adapted to receive the terminals of an electrical circuit component, said recesses being provided in the sides of said body portion, said socket recesses being moulded in the body adjacent through holes extending through the body, there being provided a through hole individual to each different recess, the body and the interior of the through holes having been coated with electrically conducting material which has subsequently been selectively removed to leave conductive material in the recesses and the through holes and on the body to provide electrical connections from the recesses to the through holes individual thereto, means for clamping the terminals into individual ones of said recesses, said clamping means comprising a clamping ring provided with ramps engaging in the individual recesses whereby when the ring is fitted around the projecting portion the ramps thereon engage in the recesses for tightly engaging connectors from electrical circuit components against the conductive material in said recesses.

3,860,314
CURRENT CIRCUIT TERMINAL BLOCK ADAPTER

Paul R. Vandiveer, 312 N. 60th St., and Elbert Wayne Young, 1414 34th St., Apt. 124, both of Phoenix, Ariz. 85018

Filed July 20, 1973, Ser. No. 381,274
Int. Cl. H01r *9/00, 29/00*
U.S. Cl. 339—18 R 4 Claims



1. In an electrical power monitoring and test system for electrical power lines including at least one terminal block for establishing electrical communication between the monitoring and testing apparatus and the power lines, the terminal block including a plurality of parallel channels extending transverse to the longitudinal axis of the terminal block, each of the channels having a set of first and a second electrical terminals disposed therein and a bus bar disposed within each channel for interconnecting each said set of first and second electrical terminals, the improvement comprising:

a. an insulator board extending across the terminal block, said insulator board including a plurality of threaded apertures, each of said apertures being in axial alignment with one of said first electrical terminals of each said set of terminals;

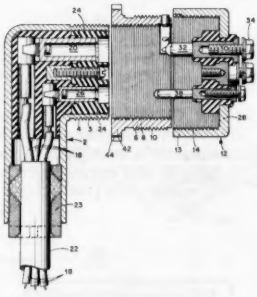
b. an electrically conducting threaded post threadedly engaging each of said threaded apertures, said post being rotatable into and out of electrical contact with the corresponding one of said first electrical terminals; and

c. electrical attachment means for securing an electrical conductor to said post; whereby, each of said posts may selectively electrically engage one of said first electrical terminals of said set of terminals to provide an electrical pick-off without affecting the electrical integrity of the electrical circuit connected to the corresponding one of said set of electrical terminals.

3,860,315
EXPLOSION PROOF CONNECTOR

Joseph E. Tetreault, Norwell, and Edward D. Winkler, Reading, both of Mass., assignors to Anderson Power Products, Inc., Boston, Mass.

Filed Aug. 14, 1972, Ser. No. 280,427
Int. Cl. H01r *13/54*
U.S. Cl. 339—89 M 2 Claims



1. An explosion-proof connector comprising:

a first tubular element having a plurality of first conductors extending therein and terminating short of one end of said first tubular element;

a contact on the end of each said first conductor;

means sealing said first tubular element against the passage of gas therethrough;

the said one end of said first tubular element being exteriorly threaded;

a second tubular element having an interior diameter greater than the exterior diameter of said first tubular element and having a corresponding plurality of other conductors extending therein and terminating short of one end of said second tubular element;

a contact on the end of each of said other conductors adapted to make electrical connection with the corresponding contact on one of said first conductors as the contacts are moved axially toward each other;

means sealing said second tubular element against the passage of gas therethrough;

the end of said second tubular element being interiorly and oppositely threaded from the exterior threads of said first tubular element;

a coupling in the form of a short sleeve threaded interiorly to engage the exterior threads of said first tubular element and threaded exteriorly to engage the interior threads of said second tubular element; and,

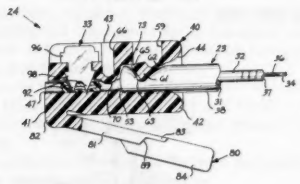
means for preventing complete removal of said sleeve from said second tubular member comprising: a spring pressed radially extending dog near one end of said sleeve; and, a cooperating notch in said second tubular element adapted to receive said dog when said sleeve has been unscrewed from said second tubular element to a predetermined position, whereby after said sleeve has been placed in initial threaded engagement with the said first and second tubular elements continued rotation of said sleeve will draw the ends of said elements into telescoping position and said contacts will engage each other, and whereby when said contacts are in engagement with each other and said sleeve is rotated in the opposite direction, said contacts will be separated before either of said first and second tubular elements is separated from said sleeve.

3,860,316

ELECTRICAL CONNECTING DEVICES FOR TERMINATING CORDS AND METHODS OF ASSEMBLING THE DEVICES TO CORDS

Edwin Charles Hardesty, Perry Hall, Md., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed July 6, 1973, Ser. No. 377,154
Int. Cl. H01r *13/54*
U.S. Cl. 339—91 R **23 Claims**



1. An electrical connector for terminating a cord having a plurality of insulated conductors and for making electrical contact external to the connector, which comprises:

an unipartite dielectric housing, with internal surfaces thereof defining a cavity that opens to at least one end of the housing for receiving an end portion of the cord, the surfaces of the housing as formed and defining the cavity substantially enclosing the entire end portion of the cord, with at least one portion of the surfaces defining the cavity being movable relative to the remainder of the surfaces defining the cavity at least partially into the cavity for engaging portions of the cord to secure the cord within the housing and to prevent unintended lateral and longitudinal movement thereof the housing also including a plurality of terminal-receiving openings communicating with the cavity and the exterior of the connector; and

a plurality of electrically conductive terminals positioned within associated ones of the terminal-receiving openings each of which includes:

a first contact portion extending into the cavity for piercing the insulation of and making electrical engagement with an associated conductor of the cord; and

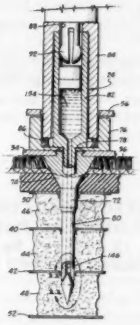
a second contact portion positioned within the associated terminal-receiving opening for making electrical contact external to the connector.

3,860,317

PROBE CONNECTOR RECEPTACLE DEVICE FOR AREA TYPE ELECTRICAL DISTRIBUTION SYSTEM

Lon A. Williams, Wareham, and George B. Williams, New Bedford, both of Mass., assignors to Dole Electro-Systems, Incorporated, Palo Alto, Calif.

Division of Ser. No. 328,144, Jan. 30, 1973, Pat. No. 3,809,969.
This application Nov. 21, 1973, Ser. No. 417,776
Int. Cl. H01r *13/52*
U.S. Cl. 339—94 A **5 Claims**



1. A probe element for use in a receptacle device of an area type power and/or signal distribution system, said probe element comprising:

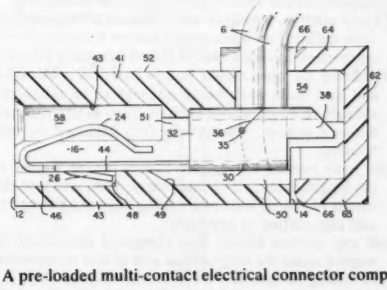
an upper body member having a central cavity and an integral shank portion of a smaller diameter extending downwardly from said body member, said shank portion having a central passage extending from said cavity to an opening at the lower end of said shank portion; a tip member attached to the lower end of said shank portion and covering said opening therein; a quantity of viscous sealant filling said central passage and part of said cavity; and a movable piston means above said sealant within said cavity for forcing said sealant to disengage said tip means and dispense sealant through the opening of said passage when acted upon by an axial force within said cavity.

3,860,318

PRE-LOADED ELECTRICAL CONNECTOR

Robert Philmore Reavis, Jr., Statesville; Lincoln Edwin Roberts, Winston-Salem, and John Robert Shoemaker, Walkertown, all of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 4, 1973, Ser. No. 347,956
Int. Cl. H01r *9/08*
U.S. Cl. 339—99 **5 Claims**



1. A pre-loaded multi-contact electrical connector comprising:

an insulating housing having a mating side and a rearward side, said housing having a plurality of contact-receiving

cavities extending therethrough from said rearward side, said cavities having openings which open onto one side which is between said mating side and said rearward side, an electrical contact terminal in each of said cavities, each of said terminals having a contact portion which is proximate to said mating side and a conductor receiving portion which is proximate to said rearward side, said conductor receiving portion being tubular and having an axially extending open seam, said seam constituting a conductor-receiving slot which extends in said conductor receiving portion inwardly from said rearward side towards said mating side, said slot being on the side of said tubular section which is adjacent to said opening whereby,

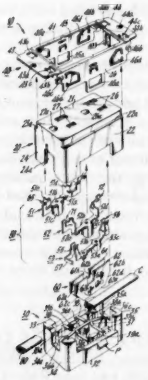
upon movement of a conductor laterally of its axis into said slot, the edges of said slot will engage said conductor to form an electrical connection therewith, and said conductor, after being connected to said terminal, will extend laterally of said housing from said opening.

3,860,319

BOXLESS ELECTRICAL COMPONENT

Thomas S. Slater, 62 Litchfield Rd., Port Wash., N.Y. 11050

Filed Sept. 13, 1973, Ser. No. 396,707
Int. Cl. H01r *9/06*
U.S. Cl. 339—99 R **11 Claims**



1. An electrical component adapted to be electrically connected to a plural-wire cable including individually insulated conductor wires covered by an insulating sheath while eliminating the need for stripping or preliminary preparation of the cable or conductor wires in any way prior to assembly of the component and the cable, said component comprising:

a body portion having a front face and integrally joined walls defining an open-ended hollow interior;

a cap portion having a rear face and integrally joined walls defining an open-ended hollow interior, said cap walls and said body walls being adapted to be telescopically slidably received within each other so as to cooperatively define a hollow, substantially fully enclosed component housing;

said body portion having first cutting means aligned along the longitudinal axis of said component, said first cutting means having at least one cutting edge projecting toward said cap portion in assembly;

said cap portion having first elongated projection means aligned along the longitudinal axis of said component and extending toward said body portion in assembly;

said body walls and said cap walls each being provided with first and second end slots aligned along said longitudinal axis and adapted to receive and surround a substantially straight portion of said cable and to align said cable along said longitudinal axis;

first and second conductive contact means positioned on opposite sides of said cutting means in said body, each of said first and second conductive contact means including cutting means integral therewith;

said body portion further including a pair of sloping separating walls positioned between said first cutting means and each of said first and second conductive contact means;

said cap portion including second projection means extending transversely to said first elongated projection means;

said first elongated longitudinal projection means of said cap adapted to urge said cable into engagement with said first cutting means to thereby sever said cable sheath along its longitudinal axis and said second transverse projection means of said cap adapted to cause the severed conductor wires in said cable to move along said sloping separating walls of said body portion to thereby spread said conductor wires apart and move them toward and into engagement with said first and second conductive contact means as said cap and body are pressed together during assembly,

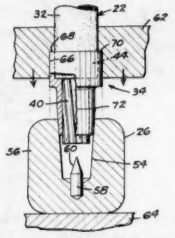
said cutting means integral with each of said first and second conductive contact means cutting through said individual conductor wire insulation upon engagement therewith to establish electrical connection with said conductive contact means and said conductor wires.

3,860,320

DANGLER CATHODE CABLE ASSEMBLY

Robert Danner, Warren, Mich., assignor to Joseph D. Kinnear, Warren, Mich.

Filed Apr. 9, 1973, Ser. No. 349,109
Int. Cl. H01r *11/20*
U.S. Cl. 339—100 **14 Claims**



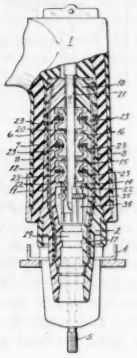
1. In combination, a sheathed electrical conductor cable having a stripped end comprising a plurality of wire strands and means securing the cable to a cathode comprising a metal sleeve having a bore therein which is circumferentially continuous throughout its length and through which the wire strands extend axially, means forming a sealed connection between the cable sheath and said sleeve, said cathode having a tapered socket therein, said sleeve having a tapered outer surface circumferentially surrounding said wire strands and in tight frictional engagement with said socket, said sleeve being subjected by said socket to radially inwardly compressive forces which are transmitted by said sleeve radially inwardly to said wire strands to an extent such that the cross sectional area of one circumferentially continuous portion of the stripped end of the cable within the cathode is substantially smaller than the cross sectional area of the wire portion of the cable disposed axially outwardly of the cathode, said one portion of said stripped end of the cable having the appearance of being substantially free of interstices between the wire strands so as to present in section the appearance of a single solid conductor, the taper of said socket being at an angle of not greater than 3½° to the axis of the socket, said sleeve being retained

in said socket solely by the frictional engagement between the interengaged tapered surfaces of said sleeve and socket.

3,860,321
SEPARABLE ELECTRICAL CONNECTORS

Robert D. Ball, Tucker, Ga., assignor to Kearney-National, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 7,942, Feb. 2, 1970, Pat. No. 3,668,614. This application Oct. 5, 1970, Ser. No. 77,913
Int. Cl. H01r *13/52*
U.S. Cl. 339—111 **5 Claims**



1. In a compound copulatory electrical connector for selectively connecting and disconnecting an energized electrical conductor with or from a load, said connector having separable portions, one of said portions having:

a. a conductive probe mechanically mounted thereto at one end and electrically connected with said conductor at the same end, said probe having a free end remote from said mounting;

b. a non-conductive open-ended receptor surrounding said probe in radially spaced relationship;

the other of said portions having:

c. a non-conductive probe having a free end with an exterior surface shaped to mate with the interior of said receptor (b);

d. a conductive receptor having an interior surface shaped to mate with the exterior of said conductive probe (a) adjacent the free end thereof, said interior surface being spaced from the free end of said non-conductive probe (c) by a distance substantially equal to but less than the length of said conductive probe (a) within said non-conductive receptor (b);

e. a pair of arc-pinching elements mounted within said non-conductive probe (c) between said conductive receptor (d) and the free end of said non-conductive probe (c), said arc-pinching elements being resiliently biased towards each other and having faces that contact to obstruct arc travel, but said elements being free for forcible movement away from each other for a distance sufficient to accommodate said conductive probe (a) between them;

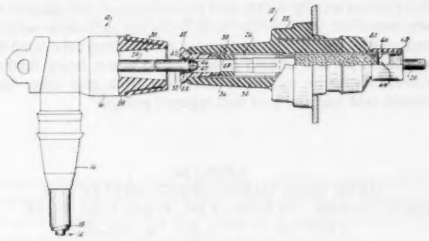
the improvement which comprises, said pair of arc-pinching elements (e) is mounted adjacent said conductive receptor; and

f. each member of said pair has a cavity formed along an edge of its face and opening toward said conductive receptor with said cavities providing for arc communication between said probe (a) and receptor (d) during insertion and withdrawal of said probe between said arc-pinching elements.

3,860,322
SEALED ELECTRICAL CONNECTOR

Edward L. Sankey, New Berlin, Wis., and Thomas J. Holtgrieve, Warren, Ohio, assignors to RTE Corporation, Waukesha, Wis.

Continuation of Ser. No. 214,603, Jan. 3, 1972, abandoned. This application May 3, 1974, Ser. No. 466,881
Int. Cl. H01r *13/52*
U.S. Cl. 339—111 **6 Claims**



1. A high voltage load break plug for a bushing having an electrically conductive contact and an arc extinguishing sleeve on the end of the contact, said plug having an electrically conductive probe and an arc-extinguishing follower on the end of the probe, the improvement comprising,

a resilient seal ring mounted on the follower and having an outer diameter equal to or greater than the inner diameter of the sleeve to sealingly engage the sleeve, said seal ring being located at the end of the follower remote from the probe so that the products of decomposition produced upon interruption are confined in the space between the follower and the sleeve and within the bushing.

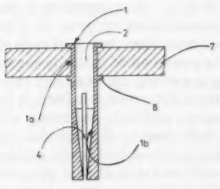
3. A high voltage load break bushing for a plug having an electrically conductive probe and an arc-extinguishing follower on the end of the probe, the bushing having an electrically conductive contact and an arc-extinguishing sleeve on the end of the contact, the improvement comprising,

a resilient seal ring mounted within and adjacent to the open end of said sleeve to sealingly engage said follower upon interruption and having an inner diameter equal to or smaller than the outer diameter of the follower to confine the gases produced by the heat of the arc upon interrupton in the space within the bushing.

3,860,323
PLUG-IN CIRCUIT ELEMENT

Artur Fischer; Gerhard Porlein, both of Tumlingen, and Theo Killgus, Freudenstadt, all of Germany, assignors to Artor & Fischer, Tumlingen, Germany

Filed Sept. 11, 1973, Ser. No. 396,192
Claims priority, application Germany, Sept. 12, 1972, 2244656
Int. Cl. H01r *11/22*
U.S. Cl. 339—258 R **6 Claims**



1. In a plug-in circuit element for use with larger-diameter contact pins and with smaller-diameter contact wires, a com-

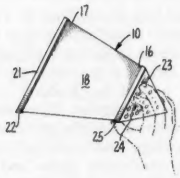
bination comprising a support member; and at least one contact sleeve mounted on said support member and provided with a center passage, said contact sleeve having a first longitudinal portion extending partially from one end to an other end of said sleeve, and a second longitudinal portion extending from said first portion to said other end, and said center passage having a first elongated section of a constant diameter located within said first portion and adapted to accommodate a contact pin in frictional surface-to-surface engagement, and a second elongated portion of a smaller diameter than said first portion located within said second portion and adapted to accommodate a contact wire in frictional surface-to-surface engagement said first and second portions being connected by a tapered portion of said passage, said sleeve being further provided with an axial slot extending from said other end toward said one end past said tapered portion.

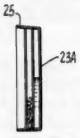
3,860,324

HAND HELD IMAGE DESIGN REFLECTOR

Hector Gonzalez, 745 Hillcrest Dr., Felton, Calif. 95018

Filed Nov. 2, 1972, Ser. No. 303,263
Int. Cl. G02b *27/08*
U.S. Cl. 350—5 **3 Claims**





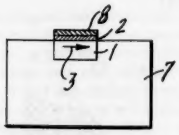
1. A hand held toy comprising a three sided truncated pyramidal shaped housing open at both ends, a reflecting material on the interior surface of each side, and a triangular cover for the small end of said housing of light passing material forming a viewing surface, said small end cover having marginal flanges for removable friction fit over said small end of said housing, and light reflecting objects on and partly obstructing light passing through the said outer side of said cover producing non-symetrically divided images in the reflecting interior surfaces of said pyramidal shaped housing, when viewed through the open large end of said housing through which the ambient light passes, said large open end providing a viewing field available to a plurality of viewers simultaneously.

3,860,325

ELECTRIC FIELD DISPLACING TYPE OPTICAL ISOLATOR

Shigeo Matsushita; Toru Sumimoto, and Teiji Uchida, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed June 26, 1973, Ser. No. 373,659
Claims priority, application Japan, June 30, 1972, 47-66091
Int. Cl. G02b *5/14*
U.S. Cl. 350—96 WG **2 Claims**



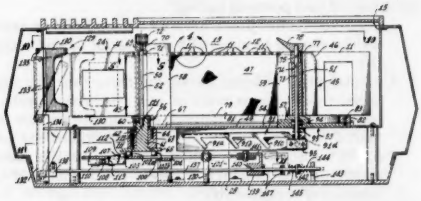
1. An electric field displacing optical isolator comprising: a dielectric substrate, a dielectric light guide for transmitting light rays, at least a part of said dielectric light guide being adjacent to a part of a surface of said dielectric substrate and in parallel with said substrate surface, a thin film of magnetic material provided adjacent to said part of said light guide; said thin film of magnetic material being magnetized in a direction which is parallel to said substrate surface and perpendicular to the transmission direction of said light rays within said light guide, and a resistance body capable of absorbing light rays, said resistance body being provided adjacent to said part of said light guide.

3,860,326

SLIDE PROJECTOR DRIVE MECHANISM

Gerald J. Frey, 3887 State St., Suite 202, Santa Barbara, 93105, and Gary E. Peterson, Sun Valley, Calif., assignors to said Frey, by said Peterson

Division of Ser. No. 200,468, Nov. 19, 1971, Pat. No. 3,729,254. This application Aug. 17, 1972, Ser. No. 281,418
Int. Cl. G03b *23/08*
U.S. Cl. 353—109 **14 Claims**



1. In a slide projector having means for supporting an endless slide holder arranged to hold a series of slides in side-by-side relation, said supporting means including an upright shaft around which said holder passes so that successive slides project outwardly on one side of said shaft into a projection station beside said shaft, a drive mechanism for said projector, comprising:

a hub at the lower end of said shaft having a plurality of abutments depending from its lower side, and angularly spaced around said hub at preselected intervals to be driven angularly to rotate said shaft;

a reciprocating driver mounted in said projector for generally horizontal back and forth movement beneath said hub, with the upper side thereof adjacent said hub;

a reciprocating actuator connected to said driver and operable when activated to move said driver in said one direction from an inactive position through a forward stroke,

and then back in said other direction through a return stroke;

means for selectively positioning said driver relative to said hub for reciprocation along first and second laterally spaced paths;

and driving abutment means on said driver comprising two laterally spaced lugs projecting upwardly from said driver and mounted thereon for downward yielding, said lugs being spring-loaded upwardly and having substantially vertical sides for engaging said abutments during said forward strokes and inclined upper sides for engaging said abutments during said return strokes and acting as cams for pushing the lugs down to pass said abutments, one of said lugs being positioned for engagement with abutments along one side of said hub as the driver is reciprocated along said first path, and the other of said lugs being positioned for engagement with the abutments along the other side of said hub as the driver is reciprocated along said second path thereby providing selectively reversible operation of said projector.

3,860,327

HIGH RESOLVING POWER COPYING LENS OF UNITY MAGNIFICATION

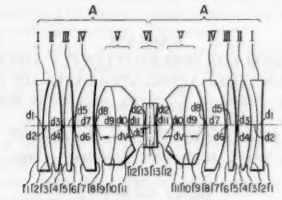
Ichiro Kano, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 12, 1973, Ser. No. 323,226

Claims priority, application Japan, Jan. 31, 1972, 47-10564

Int. Cl. G02b *9/64*

U.S. Cl. 350—214 **5 Claims**



1. A high resolving power copying lens, of unity magnification, comprising a longitudinally symmetrical lens assembly including, in succession and starting from the opposite outer ends of the assembly and proceeding toward the center of the assembly, two lens members (I) (I) having their surfaces with the smaller absolute value of radius of curvature facing toward the center of said lens assembly, at least four double convex lens members (II) (II), (III) (III), two positive meniscus lens members (IV) (IV) having concave surfaces facing toward the center of said lens assembly, two negative meniscus lens members (V) (V) each comprising two lens elements cemented together and having their surfaces nearest the center of said lens assembly concave toward said center, and an equiconcave lens member (VI) at the center of said lens assembly and common to both symmetrical halves of said lens assembly.

3,860,328

MEASURING ATTENUATOR FOR AN OPTICAL NULL SPECTROPHOTOMETER

John Richard Firth, Cambridge, England, assignor to Pye Limited, Cambridge, England

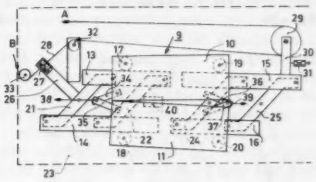
Filed July 6, 1973, Ser. No. 377,067

Claims priority, application Great Britain, July 12, 1972, 32516/72

Int. Cl. G02f *1/28*; G01j *3/42*

U.S. Cl. 350—271 **8 Claims**

1. A measuring attenuator for an optical null spectrophotometer, in which two opaque plates are mounted so as to provide a wedge shaped space therebetween, in which the two plates are movable together substantially along the axis of symmetry of the wedge to perform the measuring operation between lower and upper transmittance limits, and in which



means are provided which enable the relative positions of the plates to be adjusted from a point remote from the attenuator so as to change both the lower and upper transmittance limits whilst keeping the same range between said limits.

3,860,329

UNIQUE PRISMATIC ELEMENT AND MOUNTING ARRANGEMENT THEREFOR

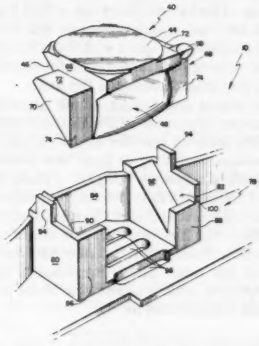
Philip G. Baker, Peabody, and William A. Hoomes, Marblehead, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 215,000, Jan. 3, 1972, Pat. No. 3,767,293.

This application May 17, 1973, Ser. No. 361,061

Int. Cl. G02b *7/18*

U.S. Cl. 350—287 **21 Claims**



1. A product for use in photographic projection operations when mounted in receiving means including support surfaces, comprising:

a light reflecting prismatic element having a pair of light transparent optical faces, a single reflective face and two lateral faces extending substantially perpendicular to at least one of said pair of light transparent optical faces, and means for cooperating with such receiving means for mounting and aligning said product in its operative position, said mounting and aligning means comprising a pair of ear extensions extending from said lateral faces of said prismatic element and having at least a portion thereof complementarily configured with respect to such supporting surfaces, said ear extensions being positioned and constructed so as to provide means for holding said prismatic element without interferring with the entrance and exit of light into and out of the optical faces of said prismatic element.

3,860,330

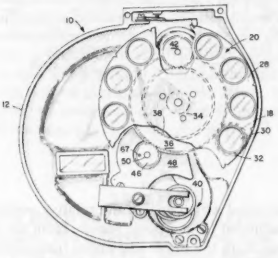
REFRACTOR WITH A SYNCHRONIZED CYLINDER LENS AXIS AND CROSS CYLINDER LENS AXIS

Staffan B. Persson, Kenmore, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Apr. 25, 1973, Ser. No. 354,429

Int. Cl. A61b *3/02*

U.S. Cl. 351—29 **4 Claims**



1. In combination with vision analysis apparatus having a battery, including:

a viewing tube;

a cylinder lens assembly having cylinder lenses mounted thereon with each cylinder lens having a cylinder axis;

means for positioning a selected cylinder lens in alignment with said viewing tube;

means for setting the cylinder axis of the selected cylinder lens in the viewing tube; and

a cross cylinder assembly mounted on the battery and having a cross cylinder lens, a yoke lying on a flip axis for holding the cross cylinder lens, a turret movably carrying the cross cylinder lens between a first position aligned with the selected cylinder lens and said viewing tube and another position unaligned with the selected cylinder lens and said viewing tube, and means for rotating the yoke in flipping movement about the flip axis;

the improvement comprising, crank assembly means for synchronous alignment of the flip axis with the cylinder axis of the selected cylinder lens when the turret is in the first position, including at least two crank mechanisms, each crank mechanism lying on a plane parallel to the plane of the other crank mechanism, each crank mechanism having a first and second crank in spaced relation to each other, the first crank of one crank mechanism eccentrically connected by a connection means to the first crank of the other crank mechanism, the connection means lying on a plane at an angle to the planes on which the crank mechanisms lie.

3,860,331

SOUND PROJECTOR FOR MOTION PICTURE FILM

Werner Fleck, Winterbach; Erwin Weinbrecht, Stuttgart, and Gerhard Borner, Waldenburg, all of Germany, assignors to Robert Bosch Photokino G.m.b.H., Stuttgart, Germany

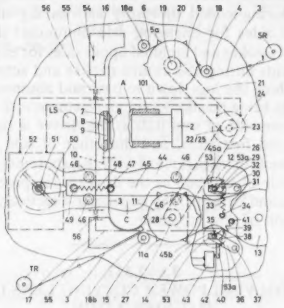
Filed Mar. 15, 1974, Ser. No. 451,592

Claims priority, application Germany, Mar. 29, 1973, 2315627

Int. Cl. G03b *31/00*

U.S. Cl. 352—14 **17 Claims**

1. In a sound projector for motion picture film which is transported lengthwise between supply and takeup reels and wherein the film frames and the corresponding portions of recorded sound are spaced apart by a predetermined distance, a combination comprising a housing; a film gate in said housing; a sprocket mounted in said housing downstream of said gate, as considered in the direction of film transport toward the takeup reel, and being rotatable in first and second directions to respectively advance the film toward the takeup and supply reels; prime mover means for said sprocket; sound reproducing means including a member over which the film is trained in said housing downstream of said sprocket; means in said housing for engaging the film with said sprocket downstream of said member; at least one tensioning element movably mounted in said housing to engage the film between said



sprocket and said member; and positioning means provided in said housing for maintaining said tensioning element in a predetermined position when said sprocket rotates in at least one of said directions, whereby said tensioning element insures that a portion of recorded sound is adjacent to said member while the corresponding film frame registers with said gate.

3,860,332

MECHANISM FOR INTERMITTENTLY ADVANCING FILM CINEMATOGRAPHIC APPARATUS OR THE LIKE

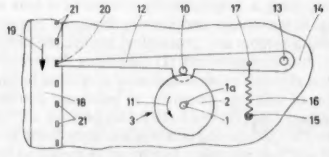
Karl Ziegler, Nellingen, Germany, assignor to Robert Bosch Photokino GmbH, Stuttgart, Germany

Filed June 6, 1974, Ser. No. 477,083

Claims priority, application Germany, June 18, 1973, 2330931

Int. Cl. G03b *1/22*

U.S. Cl. 352—194 **10 Claims**



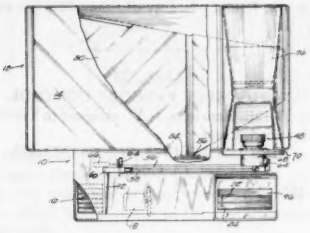
1. In a cinematographic or like apparatus wherein a film having a row of perforations is advanced stepwise in a predetermined direction and along a predetermined path, an intermittent comprising a shuttle having a claw movable in and counter to said direction to thereby move from register with a preceding into register with a following perforation and thereupon into the following perforation to advance the film in said direction; and means for moving said shuttle to thereby move said claw in and counter to said direction, comprising a rotary advancing cam including a cam face having a plurality of sections each configurated to satisfy the equation

$$S = (S_E - S_A/\alpha_E - \alpha_A)\,(\alpha - \alpha_A) - (S_E - S_A/2\pi)\,\text{Sin}\,(360/\alpha_E - \alpha_A)\,(\alpha - \alpha_A) + S_A,$$

wherein S is a section of said cam face, S_A is the starting point of the section, S_E is the terminal point of the section, α_A is the angle at the starting point and α_E is the angle at the terminal point, and follower means provided on said shuttle and engaging said cam face, said follower means tracking one of said

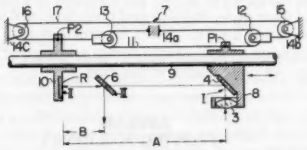
plurality of sections while said claw moves in or counter to said direction.

3,860,333
MICROFICHE READER
John N. Graef, West Bend, Wis., assignor to Realist, Inc., Menomonee Falls, Wis.
Filed Mar. 20, 1972, Ser. No. 236,493
Int. Cl. G03b *21/14*
U.S. Cl. 353—24 **7 Claims**



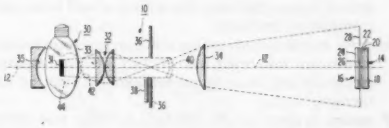
7. A microfiche reader comprising
a cabinet having an optical system projecting light through a film plane into a projection lens,
said cabinet including a front portion and a rear portion telescopically mounted on the rear of the front portion, said projection lens directing the light into a mirror system including two mirrors positioned at 90° to each other in the said rear portion of the cabinet,
the reflected image from the second of the mirrors being projected in a path perpendicular to a rear projection screen in the front of said front portion,
the telescopic mounting of said rear portion permitting movement of both mirrors as a unit in a precise path toward and from the screen whereby the effective light path from the film plane to the screen is decreased or increased twice the distance the mirrors are moved relative to said screen.

3,860,334
IMAGE INFORMATION RETRIEVING DEVICE
Shigetomi Fukuhara, Chiba; Seiichi Hayashi, Hitachi, and Chuji Tomita, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed June 19, 1973, Ser. No. 371,553
Claims priority, application Japan, June 19, 1972, 47-60520
Int. Cl. G03b *23/10, 21/08, 21/28*
U.S. Cl. 353—27 **2 Claims**



1. An image information retrieving device comprising:
a. a drum for supporting a film on which image information is recorded, and
b. an optical retrieving device comprising a convergent lens moved in the direction perpendicular to the moving direction of said film for retrieving the information image recorded on said film, a first optical member being integrally mounted together with said convergent lens for reflecting an imagebearing light, a second optical member being disposed to receive the imagebearing light reflected by said first optical member and reflect it toward said first optical member, means for slidably supporting said first and second optical members, means for moving said second optical member by a given distance on said supporting means while said first optical member moves on said supporting means by twice the given distance, a third optical member disposed at a predetermined position between said first optical member and said second optical member and having a reflecting surface which is adapted to receive the image-bearing light reflected from said second optical member and reflect it in a predetermined direction, a first belt trained around a pair of movable pulleys and fixed at opposite ends thereof to stationary members, said first belt being secured at an intermediate portion thereof to said first optical member, a second belt trained around a pair of fixed pulleys mounted to stationary members and fixed at opposite ends thereof to said movable pulleys, said second belt being secured at an intermediate portion thereof to said second optical member, and drive means operatively connected to one of said fixed pulleys for driving said first and second belt.

3,860,335
OPTICAL SYSTEM
Fausto Caprari, Jersey City, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Apr. 26, 1973, Ser. No. 354,644
Int. Cl. G03b *21/14, 21/20*
U.S. Cl. 353—102 **3 Claims**



2. An optical system comprising:
a light source, a condenser, and a field lens disposed serially along an optical axis,
said condenser and said field lens being disposed so as to provide a light object curved surface between said light source and said condenser when a light image plane is disposed beyond said field lens, whereby every point in said light image plane is focused on said light object curved surface, and vice versa,
said light source is a mercury arc lamp having an elongated mercury arc that is disposed on, and transversely to, said optical axis,
an aperture stop is disposed between said condenser and said field lens, and
every point in said light object curved surface is projected and magnified by the combination of both said condenser and said field lens onto said light image plane.

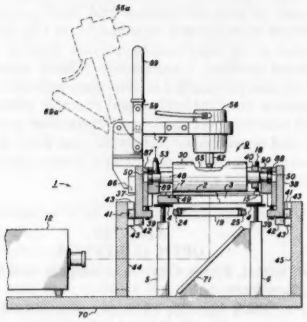
3,860,336
PHOTOELECTROPHORETIC IMAGING MACHINE AND APPARATUS FOR CONTACTING A ROLLER TO A SURFACE TO BE CONTACTED
Earl V. Jackson, Penfield; Wayne F. Schoppe, Webster; Gino F. Squassoni, Pittsford, and Peter J. Warter, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed June 25, 1973, Ser. No. 373,560
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 P **35 Claims**

1. Photoelectrophoretic imaging apparatus comprising:
a. a transparent electrode adapted to support imaging suspension;

b. a carriage;

c. a mount pivotally secured to said carriage, said mount including means for permitting said mount to pivot about an axis parallel to said transparent electrode and perpendicular to the direction of advancement of said carriage and said mount;

d. at least one roller rotatably mounted to said mount to permit said roller to pivot, in a plane perpendicular to the direction of advancement of said roller, in response to non-uniform transverse contact between the surface of said roller and said transparent electrode; and said pivotally secured mount permitting said mount and said roller to pivot about an axis parallel to said transparent elec-



trode and perpendicular to the direction of advancement of said roller, in response to changes in elevation of the area of contact between the surface of said roller and said transparent electrode;

e. drive means for advancing said carriage, said mount and said roller, said roller into contact with said transparent electrode and imaging suspension that may be carried thereon;

f. means to apply an electric field between said roller and said transparent electrode; and

g. means to imagewise expose imaging suspension between said roller and said transparent electrode to activating electromagnetic radiation through said transparent electrode.

3,860,337

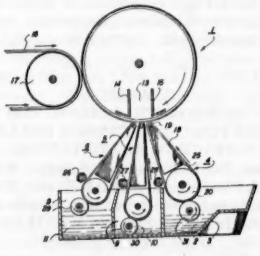
MULTIPLE EXPOSURE METHOD AND APPARATUS

Raymond K. Egnaczak, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 104,333, Jan. 6, 1971, Pat. No. 3,719,484. This application Nov. 21, 1972, Ser. No. 309,044

Int. Cl. G03g *13/10*

U.S. Cl. 355—4 **7 Claims**



1. In an imaging system of the type wherein full frame images are formed from polychromatic photoelectrophoretic ink by scanning said ink with an electric field established in the nip between imaging and transparent electrodes and with a narrow slit light image, the improvement comprising

a plurality of closely spaced imaging electrodes positioned within the boundaries of said slit light image wherein each image electrode includes a web forming a nip with the transparent electrode and

drive means for moving said webs relative to said transparent electrode in a manner to establish a substantially zero relative velocity between them in the nip during a scanning pass.

whereby said ink is exposed to a light image and subjected to electric field a plurality of times during a single scanning pass.

3,860,338

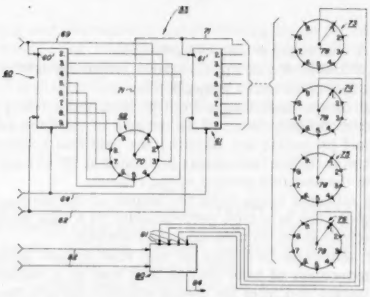
ADJUSTABLE FADEOUT CONTROL

Edward G. Reehil, Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 15, 1973, Ser. No. 323,690

Int. Cl. G03g *15/22*

U.S. Cl. 355—14 **16 Claims**



6. In an electrostatic reproduction machine having a moving photoconductive plate adapted to be uniformly charged and to carry an electrostatic latent image thereon, developing means positioned at a development zone to develop the electrostatic image on the plate, and a discharge device adapted when activated to discharge a charged area of the plate at a predetermined position in the travel of the plate upstream of the development zone, the combination of:

means to generate a control signal identifying said plate non-image areas;

control means associated with said discharge device and responsive to said control signal to activate said discharge device for a predetermined interval whereby to discharge non-image areas of said plate as said non-image areas of said plate move through said predetermined position, and means for displacing said control signal to change the time when said discharge device is energized and thereby vary the plate discharge location.

3,860,339

COPYING MACHINE

Dennis M. Bendall, Coleford, England, assignor to Xerox Corporation, Stamford, Conn.

Filed June 19, 1973, Ser. No. 371,657

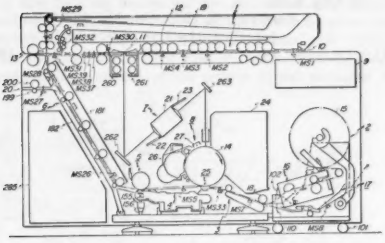
Int. Cl. G03g *15/00*

U.S. Cl. 355—14 **5 Claims**

1. An improved electrostatic copying machine for handling documents to be reproduced and copies produced along alternate transport paths comprising:

means for transporting documents along first or second paths,

means for transporting copies along third or fourth paths wherein a one of said copy paths intersects with a one of said document paths, and



control means for selectively transporting the documents and copies along a desired predetermined path at the option of a machine operator while preventing a combination which would result in the aforementioned intersecting paths.

3,860,340

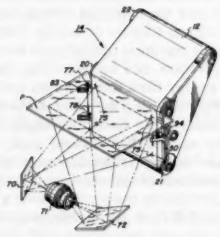
OPTICAL ALIGNMENT ON VACUUM PLENUM

William E. Jordan, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 151,406, June 9, 1971, abandoned. This application Jan. 29, 1973, Ser. No. 327,378

Int. Cl. G03g *15/00*

U.S. Cl. 355—16 **2 Claims**



1. An electrostatic printing machine having an exposure station, and an imaging system which includes an image plane, the machine comprising:

an assembly comprising a plurality of rollers movably mounted for supporting and guiding a flexible photoreceptor member around the rollers to effect an exposure run at the exposure station when the assembly is in its working position;

a holddown device comprising a plenum plate, the plenum plate defining a planar surface against which the photoreceptor member is held for maintaining the surface of the latter in a substantially planar condition at the exposure station, the plenum plate being mounted for limited movement in a direction substantially perpendicular to the image plane;

a plurality of locating devices defining the image plane in coincidence with the exposure station, the holddown device including means adapted to engage the locating devices for maintaining the surface of the photoreceptor member in the image plane during movement of the photoreceptor member;

biasing means adatped to urge the holddown device against said locating devices to maintain the surface of the photoreceptor member in the image plane;

means permitting the assembly to be moved into and out of its working position in a direction transverse to the direction in which the photoreceptor member moves around the rollers without any of the locating devices contacting the photoreceptor member;

wherein the plenum plate has a forward and a rearward edge, wherein the engaging means comprises a plurality of bearing surfaces formed in the forward and rearward edges of the plenum plate, the bearing surfaces in the rearward edge each having an inclined portion arranged thereon so that the locating devices associated therewith will slide over the surface as the assembly is moved into its working position, and wherein the locating devices associated with the bearing surfaces on the forward edge are movable mounted so that the locating devices can be moved into and out of contact with their associated bearing surfaces so as to permit the assembly to be locked into and unlocked from its working position.

3,860,341

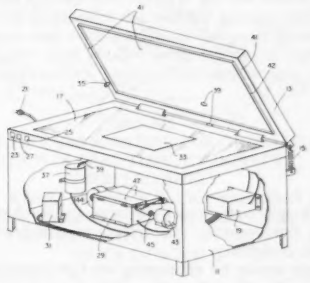
AUTOMATIC LIGHT EXPOSURE DEVICE FOR THE GRAPHIC ARTS

Philip E. Tobias, 1872 Watson Rd., Abington, Pa. 19001

Filed Aug. 29, 1973, Ser. No. 392,477

Int. Cl. G03b *27/20*

U.S. Cl. 355—115 **5 Claims**



1. An automatic light exposure device comprising in combination: housing means; transparent means disposed to form the top of said housing means; lid means movably secured to said housing means and formed and disposed to fit over and come in contact with said transparent means; flexible means disposed to form a substantial portion of the side of said lid means which comes in contact with said transparent means; vacuum effecting means connected to said flexible means to effect a substantial vacuum between said transparent means and said flexible means in response to said lid means coming in contact with said transparent means thereby providing a force against said flexible means toward said transparent means; lamp means; shutter means disposed to cover said lamp means when closed and to expose said lamp means when open; shutter moving means connected to said shutter means to cause said shutter means to open and close; timing means; switch means disposed on said lid means to be switched when said lid means comes in contact with said transparent means; vacuum detecting means connected to said vacuum effecting means to detect said substantial vacuum and in response thereto to provide a signal for activating said shutter moving means; and control circuitry means connected between said switch means, said vacuum detecting means, said shutter moving means, said timing means, and said vacuum effecting means whereby when said switch means is switched said vacuum effecting means effects said substantial vacuum so that said force causes said flexible means to come in close contact with said transparent means and whereby said vacuum detecting means provides a signal to cause said shutter moving means to move said shutter means to expose said lamp means

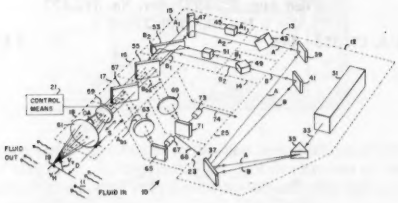
for a predetermined time, as determined by said timing means, and whereby at the end of said predetermined time said shutter moving means closes said shutter means and whereby said vacuum effecting means terminates effecting a vacuum to remove said force from said flexible means.

3,860,342

DUAL-WAVELENGTH SCANNING DOPPLER VELOCIMETER

Kenneth L. Orloff, Mountain View; George R. Grant, Sunnyvale, and William D. Gunter, Jr., San Jose, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 18, 1973, Ser. No. 352,383
Int. Cl. G01p *3/36*
U.S. Cl. 356—28 **10 Claims**



1. Doppler velocimeter apparatus for simultaneously measuring fluid velocity components at points within a fluid stream, comprising:

a light source for developing one light beam having a first wavelength and another light beam having a second wavelength;

light splitting means for dividing said one light beam into first and second parallel light beams respectively disposed on each side of an optical axis, and for dividing said other light beam into parallel third and fourth light beams respectively disposed on opposite sides of said axis, said first and second light beams lying in a first plane including said axis, and said third and fourth light beams lying in a second plane including said axis;

light focusing means disposed along said axis and operative to focus said first, second, third and fourth light beams at a common point within the fluid stream, the light of said beams being scattered by the stream at said common point;

collecting means for collecting the light scattered at said common point;

first light detecting means responsive to light directed thereupon and operative to develop first electrical signals commensurate therewith;

second light detecting means responsive to light directed thereupon and operative to develop second electrical signals commensurate therewith; and

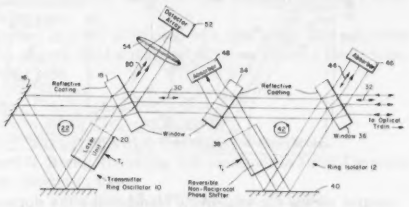
light separating means for separating the collected scattered light of said first wavelength from the collected scattered light of said second wavelength, and for directing the first mentioned separated light onto said first light detecting means and for directing the second mentioned separated light onto said second light detecting means, whereby said first electrical signals are representative of a first fluid velocity component and said second electrical signals are representative of a second fluid velocity component.

3,860,343

TRANSMIT-RECEIVE SUBSYSTEM FOR LASER RADARS

Gary M. Janney, Pacific Palisades, and Henry R. Senf, Encino, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 9, 1973, Ser. No. 404,837
Int. Cl. G01p *3/36;* **G01c** *3/08*
U.S. Cl. 356—28 **18 Claims**



1. A transmit-receive subsystem adapted for use in a pulsed laser radar system for providing laser energy to a common optical path during a transmit mode of operation while isolating a receiver unit from the application of energy thereto, and for providing a low attenuation path from the common optical path to the receiver unit during a receive mode of operation, said transmit-receive subsystem comprising:

transmitter ring oscillator means for producing laser energy and applying it in a first direction along a first optical path during the transmit mode of operation, and for directing energy arriving from the opposite direction along the first optical path to a second optical path which is displaced from said first optical path; and

ring isolator means optically coupled between said first optical path and the common optical path for providing the unidirectional transfer of energy from said first optical path to the common optical path during the transmit mode of operation, and for providing the unidirectional transfer of energy from the common optical path to said first optical path during the receive mode of operation;

whereby in a laser radar system having a receiver unit disposed along said second optical path, said subsystem provides laser energy to the common optical path while providing isolation of the receiver unit during the transmit mode, and during the receive mode a low attenuation path is provided from the common optical path to the receiver.

3,860,344

MULTI-COMPONENT INFRARED ANALYZER

James H. Garfunkel, Mound, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 10, 1973, Ser. No. 359,163
Int. Cl. G01n *21/34;* **G01j** *3/48*
U.S. Cl. 356—51 **14 Claims**

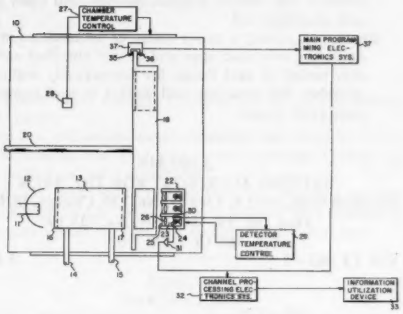
1. A multi-component gas analysis apparatus for a selective analysis for one or more gases of interest in a gaseous mixture wherein each of said gases of interest has a characteristic infrared absorption spectrum, said apparatus comprising:

a source of infrared radiation

a first filtering means, aligned to receive said infrared radiation from said source during a first time duration, said first filtering means being a filter cell means containing amounts of each of said gases of interest to be detected, a second filtering means comprising independent bandpass optical filters, each of said bandpass optical filters corresponding to a different one of said gases of interest, said bandpass optical filters disposed such that each receives a portion of said infrared radiation from said source during said first time duration and during a second time duration, and wherein each of said bandpass optical filters has a narrow passband which contains at least in

part a strong absorption line of said corresponding one of said gases of interest,

independent detector means to produce an output signal in response to received infrared radiation passed through said first filtering means and an associated one of said bandpass optical filters during said first time duration and through said associated one of said bandpass optical filters during said second time duration, said detector means being capable of an output signal response to



received radiation in less than either of said first or said second time durations,

signal processing means to obtain from said output signal of each of said detectors an apparatus output indicating an analysis result as to the corresponding one of said gases of interest, and

synchronization means for synchronizing operation of said signal processing means to said first and second time durations.

3,860,345

METHOD AND APPARATUS FOR TESTING FOR PHOSPHOR PARTICLES CONTAINED IN THE ATMOSPHERE

Raymond Raillere, and Georges Edouard Fulachier, both of Vert Le Petit, France, assignors to Etat Francais, Paris, France

Continuation-in-part of Ser. No. 269,404, July 6, 1972, Pat. No. 3,807,863. This application Nov. 16, 1973, Ser. No. 416,629

Claims priority, application France, Dec. 21, 1972, 72.45572

Int. Cl. G01j *3/30*

U.S. Cl. 356—87 **13 Claims**

1. Apparatus for detecting products contained in the atmosphere, said apparatus comprising

a rigid body defining an enclosure,

suction means for producing a negative pressure within said enclosure,

a primary burner means mounted in said enclosure,

means for supplying hydrogen to said primary burner means,

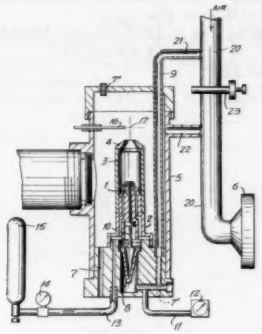
air supply means for supplying ambient air to said primary burner means, said air supply means including a capillary tube between the ambient air and the primary burner means,

a secondary burner means surrounding said primary burner means for receiving and burning hydrogen excess contained in the exhaust gases from said primary burner means, said body having openings therein for flow of air into the enclosure under the negative pressure therein, to supply air to the secondary burner means,

means for igniting the gases in the burner means,

means for optically analyzing the flame of the primary burner means to detect the magnitude of selected by-products in the ambient air supply to the primary burner means, and

said air supply means including a main conduit having an air inlet and directly connected to said suction means, a first branch line extending from said main conduit towards



said capillary tube, a second branch line extending from said main conduit downstream of the first branch line to said body to establish the negative pressure within the enclosure, and control means in said main conduit between said branch lines for diverting a portion of the inlet air to said capillary tube and first burner means.

3,860,346

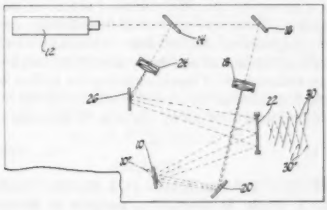
METHOD OF COMPENSATING FOR GROSS OBJECT MOTION IN REAL TIME HOLOGRAPHIC INTERFEROMETRY

Leonard A. Kersch, and Edwin B. Champagne, both of Ann Arbor, Mich., assignors to GCO, Inc., Ann Arbor, Mich.

Filed Feb. 18, 1970, Ser. No. 12,282

Int. Cl. G01b *9/02*

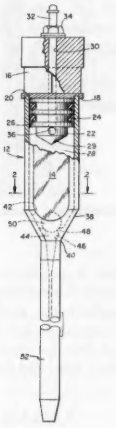
U.S. Cl. 356—109 **7 Claims**



1. In the method of detecting structural anomalies in an object by holographic interferometry including the recordation of the wave-fronts reflected from the object while it is illuminated with coherent light at a first time on a hologram and the coherent interferometric comparison of such first wave-fronts as reconstructed from such hologram with second wave-fronts reflected from the object at a second time, after deformation of the object, while it is illuminated by light coherent with that used to reconstruct the first wave-fronts from said hologram, the improvement comprising the step of altering the position of the source of light illuminating the object at said second time relative to the position of the coherent source with respect to the object at said first time so as to modify the interference of said first and second wave-fronts to alter the spacial frequency of interferometric fringes visible on the images produced by the first and second wave-fronts at localized areas on such image, as a result of deformation of the

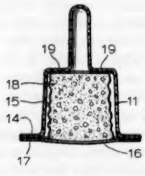
object to allow inspection for deformation anomalies in such area.

3,860,347
CUVETTE CONSTRUCTION
Alan Richardson Jones, Miami, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.
Filed Aug. 6, 1973, Ser. No. 386,028
Int. Cl. G01n 1/14
U.S. Cl. 356—246 **9 Claims**



1. A cuvette for use in photometric examination of liquid samples comprising: a hollow body having upper and lower ends, a head removably sealingly engaged within the upper end of said body and having a through passageway, one end thereof opening radially to the interior of the body, the other end of said passageway being adapted to be connected to a source of pressure and to a source of vacuum alternatively, the lower end of said body having a central port defining an entrance, a generally spherical member seated at said entrance and capable of free movement within said body, detent means inwardly disposed of said entrance to maintain a loose engagement between said ball and body at said entrance whereby to effect turbulent flow of liquid entering the hollow body therepast which is directed to the interior walls of the hollow body obviating laminar flow along the axis of the body.

3,860,348
APPLICATOR PACKAGE FOR FLUID PRODUCTS
Edward J. Doyle, Hatboro, Pa., assignor to Schick Incorporated, Lancaster, Pa.
Filed June 6, 1973, Ser. No. 367,625
Int. Cl. B43m 11/05
U.S. Cl. 401—6 **2 Claims**



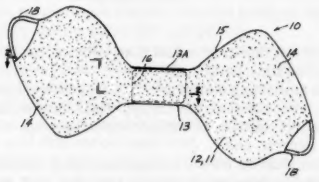
1. An applicator package for storing and dispensing a fluid product onto a desired surface comprising, in combination:

a housing defining a chamber having an open top end and a closed bottom end and containing a quantity of said fluid product, said housing further providing an outwardly extending flange about the periphery of said open end;

means comprising a compressible sponge-like dauber attached to said bottom end for absorbing said product and applying said product to said surface, said dauber having a compressed state wherein said dauber is contained entirely within said chamber, and an extended state wherein said dauber extends through said open end of said chamber; and

means comprising a cover sheet of impervious material extending over said open end of said chamber and peelably sealed to said flange for hermetically sealing said chamber and retaining said dauber in said compressed state prior to use.

3,860,349
BATHING ACCESSORY FOR THE BACK
Elizabeth Scott, 1972 E. 73rd Pl., No. 120, Chicago, Ill. 60649
Filed Jan. 19, 1973, Ser. No. 325,192
Int. Cl. A47k 7/03
U.S. Cl. 401—8 **5 Claims**



1. A bathing accessory for the back or the like, comprising a generally elongated, flexible body having a pair of longitudinally spaced, laterally enlarged portions and a narrower, central portion connecting said laterally enlarged portions, said body including two superposed layers of porous material joined together along their peripheral edges except for a portion along one edge of said central portion, one of said layers being of a plastic fabric having a plurality of perforations therein to render the same porous, said plastic fabric layer also having a plurality of outwardly extending bristles on the outer surface thereof arranged in an alternating pattern with said perforations, said body also having handle means at the opposite ends thereof to facilitate manipulation of said accessory over the body of a user, and said central portion having a pocket therein adapted to receive a bar of soap or the like, said unjoined portion being closed by a separable closure providing access to said pocket and said laterally enlarged portions providing increased surface areas for scrubbing the user's body and applying soap thereto supplied from said pocket.

3,860,350
EXTENSIBLE ARM STRUCTURE
Gerald L. Rogers, c/o Chemetron Corporation, 1801 Lilly Ave., St. Louis, Mo. 63110
Filed June 15, 1973, Ser. No. 370,436
Int. Cl. F16b 7/14
U.S. Cl. 403—104 **9 Claims**

1. An extensible arm structure comprising:

a. a first tubular member including first sidewall means at one end,

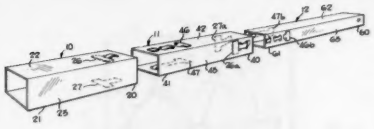
b. a first resilient bearing element attached to and extending inwardly of said first sidewall means,

c. a second tubular member telescopically received by said first tubular member through its said one end and movable to an extended arm position, said second tubular

member including second sidewall means at one end that is maintained within the first tubular member in the extended arm position,

d. a second resilient bearing element attached to and extending outwardly of said second sidewall means,

e. said first bearing element being slidingly engageable with said second tubular member, and said second bearing



element being slidingly engageable with said first tubular member,

f. the first and second tubular members including means for maintaining the first and second bearing elements in longitudinal axial alignment,

g. the first and second bearing elements including portions engaging in the extended arm position and precluding separation of the first and second tubular members.

3,860,351

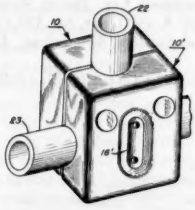
BRACE CLAMP

Morton A. Weiss, Springfield, and Bernard S. Speckhart, Short Hills, both of N.J., assignors to White Machine Co., Kenilworth, N.J.

Filed Nov. 19, 1973, Ser. No. 417,341

Int. Cl. F16b *2/02*

U.S. Cl. 403—218 **2 Claims**



1. A clamp for supporting a horizontally disposed pipe from an end portion of a vertical pipe, which clamp comprises,

a. first and second similar members made of sheet metal, each member having a base terminating in upstanding top, bottom and side walls,

b. first arcuate cutouts formed in the top walls of said members, said cutouts forming a first circular opening having a diameter substantially equal to that of the vertical pipe and each cutout having an angular extent of less than 180°,

c. second arcuate cutouts formed in the side walls of said members, said cutouts forming a second circular opening,

d. third arcuate cutouts formed in the other side walls of said members, said cutouts forming a third circular opening which is aligned with the said second circular opening for receiving the horizontally-disposed pipe,

e. means forming a pair of generally-square openings in the base of the first member, which openings are located above the arcuate cutouts formed in the side wall of such member,

f. means forming a pair of circular openings in the base of the second member, which circular openings are aligned with the said openings formed in the base of the first member,

g. fastening bolts passing through the aligned openings formed in the bases of the two members, each bolt including a generally square shank portion disposed within the associated square opening, and

h. nuts threaded onto the ends of said bolts; the arrangement being such that upon tightening the nuts the walls defining the said first circular opening bite into the surface of the vertical pipe.

3,860,352

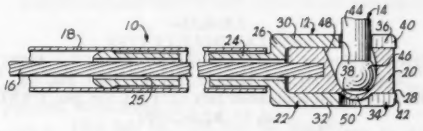
RETAINER FITTING FOR CONTROL ASSEMBLIES

John A. Carlson, Wichita, Kans., assignor to Conchemco, Incorporated, Lenexa, Kans.

Filed June 11, 1973, Ser. No. 368,737

Int. Cl. F16b *7/00*

U.S. Cl. 403—263 **10 Claims**



8. In a remote control assembly for use in conjunction with a control link, retaining means for releasably and operably joining said control assembly and said control link, said retaining means comprising:

terminal means affixed to and integral with a shiftable core element of said control assembly;

a shiftable retainer member carried by said element and presenting a pocket adapted to receive said terminal means therein,

said link having a shank portion and an enlarged free end;

a socket in said terminal means disposed to receive said free end of said link, said socket being disposed within said terminal means at an oblique angle relative to said core element; and

means for holding said link in engagement with the retainer member for unitary movement with said core element when said free end is in said angular socket and said terminal means is disposed in said pocket.

3,860,353

ADJUSTABLE CONNECTION

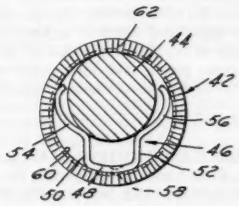
John A. Lukasik, Dundee, and Patrick J. McCarthy, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 68,945, July 5, 1972, Pat. No. 3,764,158.

This application July 5, 1973, Ser. No. 376,853

Int. Cl. F16c *3/00, 7/00*

U.S. Cl. 403—351 **11 Claims**



1. An adjustable pivot assembly constructed to be interposed between first and second pivotally related members,

said assembly including a pivot tube constructed to be connected to said first member,

a pivot shaft positioned within said tube constructed to be connected to said second member,

said shaft having a substantially smaller outside diameter than the inside diameter of said tube,

the axis of said shaft being offset from the axis of said tube, a resilient sheet metal clip constructed to provide a support for said shaft that is offset relative to the axis of said tube,

said clip being fitted within said tube,

said clip engaging both said shaft and the interior surface of said tube and constructed to prevent the lateral displacement of said shaft with respect to said tube,

said clip being normally statonary relative to said tube,

said clip being constructed to be angularly displaceable within said tube for adjustment purposes whereby the axis of said shaft may be angularly displaced relative to the axis of said tube.

3,860,354

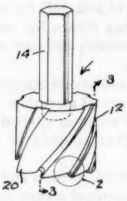
ANNULAR HOLE CUTTER

Everett D. Hougen, G-5072 Corunna Rd., Flint, Mich. 48504

Division of Ser. No. 213,430, Dec. 29, 1971, Pat. No. 3,765,789. This application July 13, 1973, Ser. No. 378,812

Int. Cl. B23b *51/04*

U.S. Cl. 408—206 **5 Claims**



1. An annular hole cutter comprising a generally circular cylindrical side wall having a plurality of cutting teeth spaced around one end thereof and having means at the other end for mounting the cutter on a rotary driving member, each tooth having a generally radially extending cutting edge at its lower end defined by a front rake face and a bottom back off face, each of said cutting edges having a radially inner portion and a radially outer portion, said two cutting edge portions when viewed in plan being inclined radially to each other such that the front rake face adjacent the inner cutting edge portion forms a positive side rake angle with the inner periphery of the side wall and the front rake face adjacent the outer cutting edge portion forms a positive side rake angle with the outer periphery of the side wall, said side wall having a radially inner gullet and a radially outer gullet, said radially inner gullet having a trailing face which corresponds with the front rake face adjacent the inner cutting edge portion and said outer gullet having a trailing face which corresponds with said front rake face adjacent the outer cutting edge portion, said inner gullet having an upper end which is inclined upwardly and radially outwardly so that the upper end of the inner gullet opens into the outer gullet, said outer gullet extending upwardly beyond the upper end of the inner gullet.

3,860,355

FORCE CONVERTING DEVICE

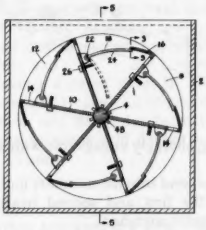
Billy Clyde Dell, 1411 Azalea St., Waycross, Ga. 31501

Filed Apr. 19, 1973, Ser. No. 352,727

Int. Cl. F03b *17/02*

U.S. Cl. 415—7 **1 Claim**

1. A device for converting force comprising a wheel immersed in a liquid mounted to turn about a horizontal axis and having spaced end walls and radially extending partitions between said end walls dividing the same into a plurality of chambers, and means to supply gas under pressure to the chamber in a lower quadrant of the wheel, whereby buoyancy imparts an upward movement to said chamber, causing the wheel to rotate, said partitions having openings therein adjacent the periphery of the wheel to permit water and gas under pressure to escape as the partitions into which the gas has been pumped turn upwardly, flap means hinged in each of said



compartments on the partition adjacent the periphery of the wheel part at a point closer to the center than said openings, and stop means for limiting outward swinging of said flap means while substantially preventing the escape of fluid past such flap means.

3,860,356

MOUNTING ARRANGEMENT FOR AN ADJUSTING CYLINDER IN AN AXIAL COMPRESSOR

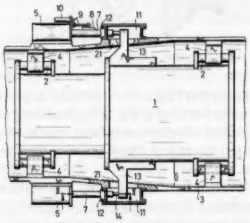
Hans Benz, Winterthur, Switzerland, assignor to Brown Boveri-Sulzer Turbomachinery Ltd., Zurich, Switzerland

Filed July 3, 1973, Ser. No. 376,140

Claims priority, application Switzerland, July 13, 1972, 010515/72

Int. Cl. F01d *17/10, 17/12, 17/16*

U.S. Cl. 415—150 **5 Claims**



1. In an axial compressor

a casing defining a gas-tight internal chamber;

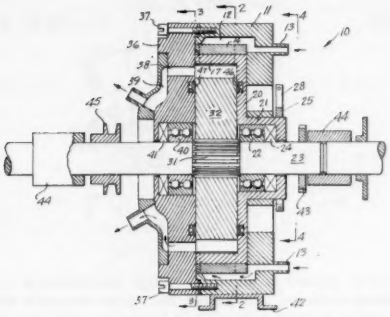
an adjusting cylinder for stator blades axially slidably mounted in said internal chamber within said casing;

a pair of linear servomotors mounted on said casing exteriorly of said internal chamber, said servomotors being operatively connected in parallel relationship with each other, each said servomotor having a piston rod extending through said casing into said internal chamber;

a seal disposed on each piston rod for sealingly mounting each piston rod in said casing; and

a pair of connecting rods, each said connecting rod coupling one said piston rod to said adjusting cylinder, each said connecting rod having a ball head at each end rotatably received in a respective piston rod and in said adjusting cylinder.

3,860,357
ROTARY STEAM ENGINE
Lewis M. D. Grainger, Rt. 1, Glen Allen, Va. 23060
Filed Oct. 1, 1973, Ser. No. 402,079
Int. Cl. F01d *1/30, 17/12*
U.S. Cl. 415—152 R **2 Claims**

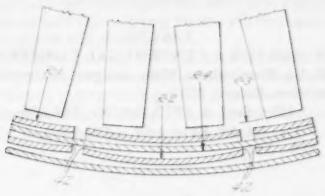


1. In a rotary steam turbine engine, a housing having a steam manifold chamber formed therein, nipples communicating with said manifold chamber to supply steam thereto from a source of steam underpressure, a ring mounted in said housing internally of the manifold chamber, said ring functioning to direct steam from the manifold inwardly through a plurality of transversely sloping first conduits, oppositely sloping second conduits intermediate each pair of first conduits, a sleeve valve mounted for rotation within the ring, said sleeve valve having a plurality of jets arranged to align with the first and second conduits, a disk member having said sleeve valve mounted thereon, and said disk member having a tubular portion on its inner end for supporting said housing, a ball bearing mounted in the tubular portion, a shaft extending through said ball bearing, a yoke secured to said tubular portion, said yoke having an upstanding finger, stops selectively engageable by said finger to control the position of the sleeve valve relative to the conduits, said shaft being splined and having a turbine rotor mounted thereon, said turbine rotor having a plurality of blades having opposed concaved working faces that are impinged by steam passing through the jets, a side piece secured to said housing, and said side piece having an exhaust manifold therein for directing exhaust steam to exhaust ports, a starter gear on said shaft to permit the turbine to be initially rotated when starting, and a pulley mounted on said shaft.

3,860,358
TURBINE BLADE TIP SEAL
Allen W. Cavicchi, and Gabor T. Ketting, both of Manchester, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.
Filed Apr. 18, 1974, Ser. No. 462,152
Int. Cl. F01d *11/08;* **F02c** *7/28*
U.S. Cl. 415—174 **4 Claims**

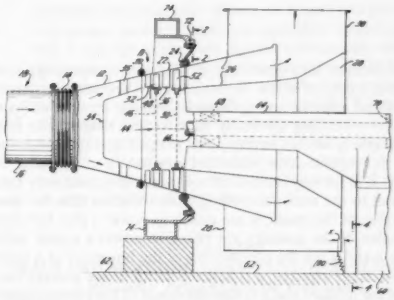
1. In a gas turbine engine which includes a turbine wheel comprising a disk and a plurality of blades radially extending from the disk, an outer case having a circumferential track at a radius greater than the radius of the wheel at the tips of the blades, and a gas seal comprising seal segments which are positioned with respect to the case track and which radially enclose the wheel to reduce gas leakage across the wheel between the case and the tips of the blades wherein the improvement comprises:

an arcuate hook which extends from each seal segment and has a radius of curvature less than the track radius, the



hook engaging the track along two lines of contact to position each seal segment with respect to the case track.

3,860,359
MOUNTING SYSTEM FOR GAS TURBINE POWER UNIT
Angelo De Feo, Passaic, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.
Filed July 30, 1973, Ser. No. 384,007
Int. Cl. F01d *1/02*
U.S. Cl. 415—209 **4 Claims**



1. A mounting system for supporting a gas turbine power unit on a base structure in which the gas turbine unit includes an annular stator housing comprising an inlet duct for supplying hot gases thereto, a stator vane assembly axially connected to and extending downstream from said inlet duct and having stator vanes extending radially across the flow path of said gases, and an exhaust duct axially connected to and extending downstream from said stator vane assembly and having an annular exhaust outlet volute and also including a rotor having blades disposed adjacent to said stator vanes and extending radially outwardly in close clearance relation with said stator vane assembly, said mounting system comprising:

a. flexible duct-like means at the upstream end of the inlet duct for flexibly connecting the inlet duct of the power unit to a source of hot gases,
b. an annular mounting ring adapted for support from said base structure and surrounding the stator housing intermediate its ends and having a mounting flange with radially inwardly facing splines,
c. an annular mounting flange secured to said stator vane assembly of the stator housing and having outwardly facing splines in meshing engagement with said mounting flange splines,
d. the engaging sides of said splines being radial relative to the axis of said power unit, and
e. a bearing pedestal adapted for support from said base structure and disposed beyond the downstream end of the exhaust duct and having a cantilevered portion extending in an upstream direction through the annular exhaust volute of said exhaust duct to provide a bearing support

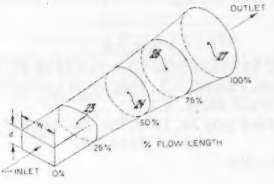
for the rotor independently of the stator housing and its annular mounting ring.

3,860,360

DIFFUSER FOR A CENTRIFUGAL COMPRESSOR

Mason K. Yu, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 4, 1973, Ser. No. 394,356
Int. Cl. F01d *1/02, 1/06, 9/04*
U.S. Cl. 415—211 **4 Claims**



1. A diffuser for a centrifugal compressor comprising a body defining a central space of circular cross-section to receive a centrifugal impeller and defining an annular array of diffusing passages extending generally radially and tangentially from the periphery of the central space, the passages being substantially rectangular at the inlets and substantially elliptical at the outlets and having cross-sections trending consistently from the inlet to the outlet according to the relation that the absolute value of the quantity x/a raised to power s plus the absolute value of the quantity y/b raised to power s equals unity, where x and y are the coordinates of the boundary of a cross-section of the passage, a is half the width of the passage radially of the diffuser and b is half the depth of the passage axially of the diffuser at the cross-section, and the exponent s is a shape factor varying progressively in value from a large value at the inlet to substantially two at the outlet, and the ratio of a to b converging toward unity toward the outlet.

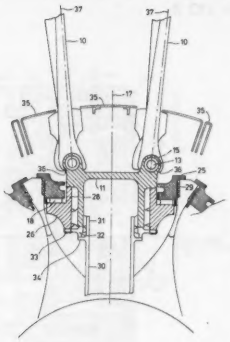
3,860,361

MULTI-BLADED FANS

David Roberts McMurtry, and Derek Percival Harris, both of Bristol, England, assignors to Rolls-Royce (1971) Limited, London, England

Filed June 20, 1973, Ser. No. 371,687
Claims priority, application Great Britain, July 6, 1972, 31570/72
Int. Cl. F01d *7/00*
U.S. Cl. 416—120 **1 Claim**

1. A multi-bladed fan comprising a rotor having a plurality of root members supported for rotation about respective axes extending radially in respect of the rotor, a pair of fan blades connected to each root member, pivot means connecting each fan blade of a said pair to its associated root member for pivotal motion about an axis transverse to said radial axis, each root member being rotatable through approximately 90° between a first position in which the blades connected to the root member are aligned circumferentially and a second position in which the blades are aligned axially with respect to the rotor, and each of said fan blades is pivotable about said pivot means through a range in which each pair of blades can adopt an orientation in which their respective stacking lines are radially outwardly divergent by centrifugal force when the blades are aligned in accordance with said first position of the root member and can adopt an orientation in which their respective stacking lines are parallel by centrifugal force when



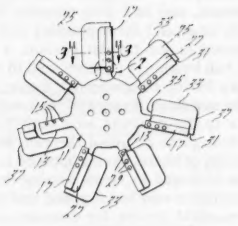
the blades are aligned in accordance with said second position of the root members.

3,860,362

FLEXIBLE BLADED FAN

Allen J. Bentley, Plymouth, and Ashok K. Goyal, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 14, 1973, Ser. No. 424,984
Int. Cl. F04d *29/38*
U.S. Cl. 416—132 **4 Claims**

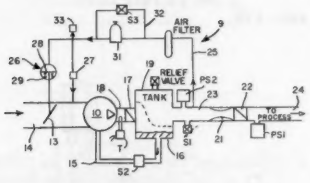


1. A fan structure including a spider having arms extending generally radially outwardly from a central hub portion,
a reinforcing member overlying one face of each of said arms,
flexible fan blades having portions underlying said reinforcing members,
fasteners securing said reinforcement members and said blades to said arms,
each of said blades having at least a leading edge, a trailing edge and a radially inner edge,
said reinforcing members overlying the portions of said blades adjacent said leading edges,
the portions of said blades trailing said reinforcing members when viewed in a radial direction being simple curves curving in a single direction,
each said reinforcing member having a trailing edge extending generally parallel to the arm to which it is secured,
said inner edge of said blade including a concave curved portion tangentially approaching said trailing edge of said reinforcing member.

3,860,363
ROTARY COMPRESSOR HAVING IMPROVED CONTROL SYSTEM

David H. Silvern, Hollywood; Stanley J. Minton, Woodland Hills, both of Calif., and Ghanshyam C. Patel, Franklin, Pa., assignors to Chicago Pneumatic Tool Company, New York, N.Y.

Filed May 11, 1973, Ser. No. 359,182
Int. Cl. F04b *49/00*
U.S. Cl. 417—12 **5 Claims**



1. A compressor system including an electric motor powered rotary air compressor having inlet and outlet passages, a receiver tank connected to the outlet passage having a discharge line, a demand process line connected to the discharge line, a check valve in the discharge line preventing backflow from the process line to the tank, a butterfly flow control inlet valve in the inlet passage, actuator means connected with the inlet valve responsive to a predetermined air pressure in the tank to throttle the butterfly valve to modulate air flow in the inlet passage to match demand process flow; sensing means responsive to a set maximum pressure developing in the process line beyond the check valve to close the butterfly valve to cause the compressor to run unloaded, and responsive to a set lower pressure developing in the process line beyond the check valve to reopen the inlet valve to cause the compressor to reload; means adjustable for determining the closing of the butterfly valve substantially at the time of development of the set maximum pressure; timing means responsive to said action of the sensing means in sensing the maximum pressure developing in the process line to de-energize the motor and cause the compressor to stop running in the event said lower pressure does not develop in a set period of time; and other sensing means responsive to the development of both said lower pressure in the process line and a set low pressure in the tank to reenergize the motor to restart operation of the compressor.

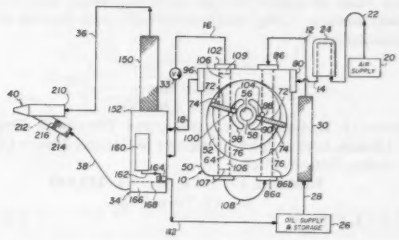
3,860,364
PUMP-COMPRESSOR SYSTEM

David Aronson, and Peter C. Zumbusch, both of Upper Montclair, N.J., assignors to Compump System, Inc., Newark, N.Y.

Continuation of Ser. No. 161,166, July 9, 1971, abandoned. This application Aug. 22, 1973, Ser. No. 390,575
Int. Cl. F04b *1/00*
U.S. Cl. 417—204 **2 Claims**

1. A self-priming pump-compressor system for simultaneously compressing gas and pumping liquid comprising (*a*) a pump-compressor body, having a pumping chamber formed therein, (*b*) a shaft rotatably mounted in the pump-compressor body and extending into the pumping chamber, (*c*) rotor means disposed about said shaft, for rotation with said shaft, eccentrically disposed within the pumping chamber of said pump-compressor body, thus providing a compression space between the rotor and interior surfaces of walls defining the pumping chamber, said rotor means having a plurality of spaced slots formed therein for slidably receiving fluid moving means, (*d*) gas inlet means and gas outlet means in communication with said pumping chamber, (*e*) liquid inlet means and liquid outlet means in communication with said pumping chamber, and (*f*) fluid moving means, operatively associated with the rotor means, upon rotation of the shaft, for compressing and moving said inlet gas to said gas outlet means and moving said inlet liquid to said liquid outlet means, the walls of the pumping chamber acting as a cam surface for said fluid moving means whereby upon said eccentric rotation of the rotor means said fluid moving means will be caused to move into and out of said slots;

(*g*) first liquid-gas separation means in communication with said pump-compressor liquid outlet means, and (*j*) means to recycle substantially gas-free liquid back to said pump-compressor liquid inlet means in communication with said first liquid-gas separation means and said pump-

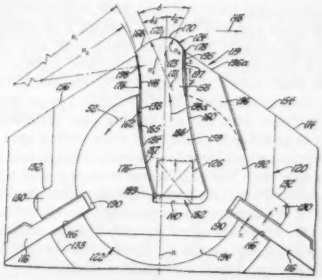


compressor liquid inlet means, to ensure self-priming of the system, said first liquid-gas separation means comprising a recycle separation means substantially vertically disposed within said pump-compressor body and having an upper portion and a lower portion, the upper portion of said recycle separation means including a first orifice of predetermined size in communication with said pump-compressor liquid outlet means, the lower portion of said recycle separation means including a second orifice of predetermined size in communication with said means to recycle substantially gas-free liquid.

3,860,365
SEALS AND METHODS AND MEANS OF SEALING FOR ROTARY ENGINES AND THE LIKE

William H. Bibbens, 16500 N. Park Dr., Southfield, Mich. 48075

Filed May 3, 1973, Ser. No. 356,885
Int. Cl. F01c *19/02;* **F04c** *15/00, 27/00*
U.S. Cl. 418—61 A **43 Claims**



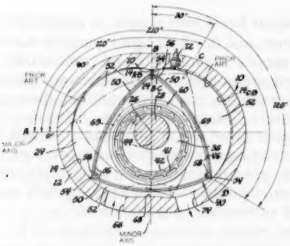
9. A sealing assembly for providing a sliding seal between two members, one of which members is movable relative to the other, said sealing assembly comprising: a groove formed in said one member, said groove extending substantially transversely of the direction of movement of said member relative to the other member, said groove having a leading side wall, a trailing side wall, and a bottom wall extending between said side walls; a seal blade received in said groove, said blade having a tip portion projecting from said groove with a work-

ing surface defined thereon for sliding, sealing engagement with a surface of said other member, said blade having a trailing side surface extending from the trailing edge of the outer tip portion and disposed in opposed relationship to said trailing side wall of said groove; said blade having a leading side surface extending from the leading edge of said outer tip portion and disposed in opposed relationship to said leading side wall of said groove; cooperating convex and concave cam surfaces on said trailing side wall of said groove and trailing side surface of said blade, respectively, operable in response to forces urging said trailing side surface into contact with said trailing side wall to produce reaction force components urging said blade to extend having upper and lower surfaces, the lower surfaces being relieved inwardly with respect to the upper surfaces.

3,860,366
ROTARY ENGINE

Robert J. Haglund, Birmingham, and Thomas R. Zimmer, Livonia, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 17, 1974, Ser. No. 433,989
Int. Cl. F01c *1/02*
U.S. Cl. 418—61 A **4 Claims**

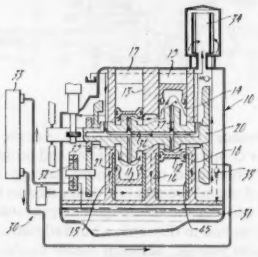


1. A rotary engine comprising a housing having a multi-lobe internal peripheral wall and two oppositely facing side walls cooperatively defining a cavity, a shaft extending through said cavity and side walls and rotatably supported by said housing, said shaft having an eccentric located in said cavity, a multilobe rotor located in said cavity and rotatably mounted on said eccentric of said shaft, means providing a fixed speed ratio between said rotor and said shaft, said rotor cooperating with said walls and said cavity to provide a plurality of chambers that are spaced about and move with said rotor while varying in volume in fixed relation to said walls as said rotor and said shaft rotate, an intake port for delivering air-fuel mixture to said chambers as they expand in an intake phase and an exhaust port for exhausting said chambers as they contract in an exhaust phase, said rotor having apex seals with curved sealing edges biased outward to engage said peripheral wall and side seals biased outward to engage said side walls to seal said chambers from each other, said peripheral wall conforming in a peripherally extending low chamber pressure zone to the imaginary outer envelope of the sealing edges of said apex seals that would be determined on rotation of said rotor and shaft with said apex seals in identical radial positions on said rotor whereby said apex seals are not required to move substantially either inwardly or outwardly to maintain engagement with said low chamber pressure zone on rotor and shaft rotation, and said peripheral wall in a peripherally extending high chamber pressure zone deviating inwardly from said outer envelope to provide peripherally spaced leading and trailing wedge portions for simultaneously wedging the respective leading and trailing apex seals of each said chamber gradually inwardly throughout said high chamber pressure zone on rotor and shaft rotation whereby apex seal engagement with said peripheral wall is mechanically enforced by wedging action of said peripheral wall in said high chamber pressure zone.

3,860,367
CONTROLLED POROUS COATING FOR ROTARY ENGINE SIDE HOUSING

Yeshwant P. Telang, Grosse Ile, and James C. Uy, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 24, 1973, Ser. No. 391,376
Int. Cl. F01c *21/10*
U.S. Cl. 418—178 **6 Claims**



1. In a rotary internal combustion engine having a narrow chamber bounded by a pair of flat side walls and an end wall joining said side walls, a rotor mounted for planetary movement in said chamber and in close spacing with each of said side walls, said rotor carrying annular seals to slidingly engage said side walls for defining a shifting oil chamber in the spacing between said rotor and each of said side walls, the combination comprising:

a. means for supplying said oil chambers with a continuous flow of oil,

b. a self-fused particle coating across the entire area of each of said flat side walls, said coating being comprised of an admixture of stainless steel and nickel-based alloy powders of generally equal hardness, and

c. a resin in said coating effective to close the pores therein below the surface of said coating without closing the pores adjacent the coating surface to thereby provide a controlled porosity of 2–3 percent of the volume of said coating, said resing being selected from those materials which decompose at the engine operating temperature, have a strong adherency to the metallic self-fused particle coating, and have a high resistance to dissolvement in oil.

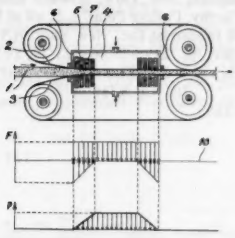
3,860,368
CONTINUOUS ACTION BOARD PRESS

Into Kerttula, Luotsikatu 1813, and Per Arno Jaatinen, Vaskisepankupa 4B, both of Helsinki, Finland

Filed Apr. 4, 1973, Ser. No. 347,913
Int. Cl. B29c *15/00*
U.S. Cl. 425—3 **11 Claims**

1. A continuous action board press comprising means defining a press gap between two moving surfaces and including at least one endless belt providing at least one of said surfaces, board material fed into said press gap, a pressure chamber loading said belt to urge the same against the board material to be pressed and thus towards the opposite press surface, the endless belt including a material adapted for being attracted by a magnet, said pressure chamber including leading and trailing ends relative to the direction of feed of the board

material, and adjacent at least one end of the pressure chamber, and at least one magnet which gives rise in the belt to a



force opposite in direction to that produced by a pressure medium in said pressure chamber.

3,860,369

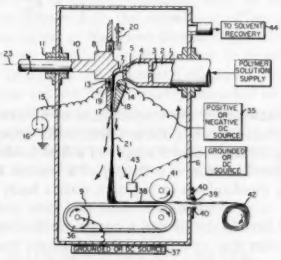
APPARATUS FOR MAKING NON-WOVEN FIBROUS SHEET

Dale Merrill Brethauer, Wilmington, Del., and Jean Paul Prideaux, Richmond, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 303,044, Nov. 2, 1972,. This application Mar. 1, 1974, Ser. No. 447,253

Int. Cl. B29j *5/00*

U.S. Cl. 425—3 **7 Claims**



1. In an apparatus for forming a fibrous web that includes means for flash spinning a polymer solution to form a plexifilamentary strand entrained in a gaseous stream, means at one location for spreading the strand to form a web and oscillating the web in a generally vertical plane in a plurality of downward radial directions toward a collecting surface and means positioned below said spreading and oscillating means for charging said web, the improvement comprising: an aerodynamic shield having front and rear members disposed on each side of said plane below said spreading and oscillating means, said members having surfaces facing said plane, said surfaces terminating in edges equispaced from each other and lying along arcs of equal radius extending from a horizontal axis proximate to said one location, the surface of the rear member facing said plane being substantially parallel to and being a stepped surface stepped away from said plane in the downward direction along one or more arcs concentric with the terminating edge of the rear member, the surface of the front member facing said plane being sea section of a surface of revolution about said horizontal axis converging downwardly toward said plane.

3,860,370

APPARATUS FOR THE MANUFACTURE OF FIBERS

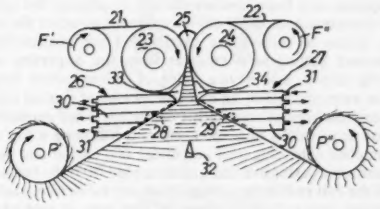
Peter Robert Fanto-Kuertoes, and Ralf Stellan Marek, both of Frolunda, Sweden, assignors to Continentale Linoleum Union Betriebs AG, Zurich, Switzerland

Filed June 15, 1973, Ser. No. 370,236

Claims priority, application Sweden, June 15, 1972, 007984/72

Int. Cl. D01d *5/12*

U.S. Cl. 425—72 **7 Claims**



1. An apparatus for the manufacture of fibres formed by stretching apart and cooling a thermoplastic material heated to at least its melting temperature, said apparatus comprising webs running over supports and forming between them a gap into which the heated thermoplastic material is fed and the width of which increases from the feeding end of the gap in the direction of movement of the thermoplastic material, the width at the feeding end of the gap being defined by means of a pair of supports which are adjustable in relation to each other, the gap increase being defined by means of at least one pair of means which are adjustable as to their distance relative to each other and which are provided with at least partly perforated support surfaces for the webs running across them, means for exhausting a gaseous medium through the perforated support surfaces, means for the blowing of a gaseous medium through the perforated support surfaces, said means for the suction and blowing are arranged under the perforated support surfaces in optional mutual order to obtain defined temperature and stretching conditions at the deformation of the thermoplastic material.

3,860,371

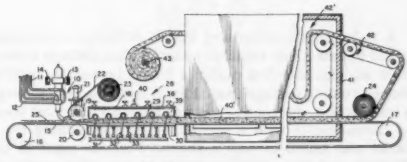
MANUFACTURE OF FOAM FILLED SHEET PRODUCTS

John Willy, Attleboro, Mass., assignor to Specialty Converters, Inc., Newark, Del.

Continuation of Ser. No. 104,012, Jan. 5, 1971, abandoned, which is a division of Ser. No. 845,115, June 6, 1969, Pat. No. 3,617,594, which is a division of Ser. No. 460,929, June 3, 1965, abandoned. This application Oct. 23, 1973, Ser. No. 408,405

Int. Cl. B29d *27/04*

U.S. Cl. 425—115 **5 Claims**



1. Apparatus for continuously casting foam sheets having reinforcing means along a moving carrier comprising means for feeding said reinforcing means for movement with said carrier, means for dispensing a foaming mixture on said reinforcing means supported by said carrier, means defining a nip through which said foam mixture and supporting reinforcing means is passed for dispersing substantially evenly said dis-

pensed foam mixture over said reinforcing means and for metering substantially the ultimate thickness of said reinforced foam sheets, said sheet being defined by a foam body and said reinforcing means, said reinforcing means being of batting material having a substantially homogeneous cross-section of a multiplicity of spaced non-woven discontinuous fibers randomly oriented in a multidirectional pattern within said foam body, said batting material having a means thickness greater than the metered distance of said nip so that said batting material carrying said foaming mixture is compressed by said nip to compact the batting, express the air therefrom, and squeeze said foam mixture therein to saturate the same, and a compression control device mounted adjacent the metering means to receive the carrier and the mixture-filled compressed batting as it emerges from the dispersing and metering means, said device being of uninterrupted length from an entrance end to an exit end located at a point where the foam has been substantially completed, is self-supporting and has acquired its final thickness and including a top and bottom plate extending over and under said carrier and being substantially coextensive and uninterrupted from the entrance end to the exit end of the compression control device, each of said plates being fixed horizontally and one of said plates being freely movable vertically, and means for maintaining pressure on the mixture-filled batting throughout the area of said movable plate sufficient to prevent expansion of the batting but permitting expansion of the foam mixture while in said device so that the foam expands in situ within the batting material and permits extension of the fibers away from their normal compacted positions in a direction toward the broad faces of the sheet being formed whereby the fibers in their extended position are positioned substantially homogeneously throughout the entire cross-sectional area of the sheet.

3,860,372

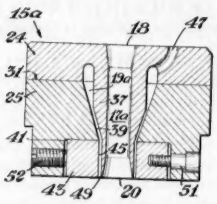
ADJUSTABLE FEEDBLOCK FOR ENCAPSULATED MULTILAYER EXTRUSION

Ritchey O. Newman, Jr., Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 119,106, Feb. 26, 1971, abandoned. This application Nov. 7, 1972, Ser. No. 304,505

Int. Cl. B29f *3/04*

U.S. Cl. 425—133.1 **21 Claims**



1. A feedblock comprising a body defining: a core passage suited to pass a first resinous material therethrough extending from an inlet to a first outlet; a hollow, generally rectilinear shaped coating passage spaced apart from the core passage by a wall section, the coating passage having a feed port adapted to communicate with a second outlet surrounding the first outlet and suited to pass a second resinous material therethrough; and two adjusting means in operative combination with a wall portion of the coating passage adapted to independently alter the cross-sectional geometry of two spaced apart, generally opposing transverse portions of the coating passage at least partially adjacent to the second outlet without altering the geometry of the first outlet by generally lateral movement of the wall portion of the coating passage to thereby minimize edge scrap loss of the second resinous material passed through the coating passage.

3,860,373

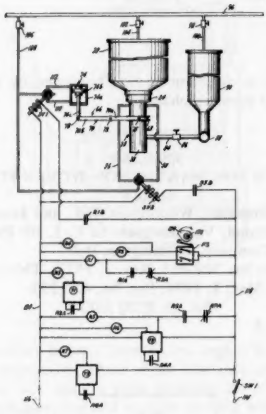
COMBINATION APPARATUS INCLUDING EXTRUDER AND SUPPLY FOR MAKING ANNULAR BODIES WITH AN ANNULAR FILLING

Harold B. Kaufman, New York; Howard Roth, Bronx, and John P. McCarthy, College Point, L.I., all of N.Y., assignors to DCA Food Industries Inc., New York, N.Y.

Division of Ser. No. 239,078, March 29, 1972, Pat. No. 3,807,919. This application Oct. 11, 1973, Ser. No. 405,467

Int. Cl. A21c *11/16*

U.S. Cl. 425—155 **11 Claims**



1. A machine for the manufacture of an extruded annular food product of two different foodstuffs comprising a first tank adapted to receive a supply of a first foodstuff, a second tank adapted to receive a supply of a second foodstuff, first extruding mechanisms including a nozzle body having a first chamber in communication with said first tank to be filled with said first foodstuff and a cutter mechanism including at least a cutter disc coacting with said nozzle body to define a radially opening first extrusion orifice, second extruding mechanisms mounted within said nozzle body and having outer and inner concentric shell members coacting to define a second chamber within said first chamber and in communication with said second tank to be filled with said second foodstuff, said shell members coacting with each other to define a second extrusion orifice which is annular and opens radially inwardly of said first extrusion orifice, said shell members being positioned in said nozzle body such that said second extrusion orifice is in substantially the same plane as said first extrusion orifice during extrusion of said first foodstuff through said first extrusion orifice for extruding said second foodstuff, and a programmed controller for selectively extruding through said first and second extrusion orifices including means for commencing the extrusion of said first foodstuff from said first extrusion orifice to partially form the elemental shape of said annular food product, means for extruding said second foodstuff from said second extrusion orifice for a predetermined time interval to introduce an annulus of said second foodstuff within said elemental shape and means for actuating said cutter mechanism after a further predetermined time interval during which the continued extrusion of said first foodstuff from said first extrusion orifice completes said annular food product.

3,860,374
AUXILIARY APPARATUS FOR CUTTING AND PUNCHING OUT BANDS OF DOUGH MOUNTABLE AT A DOUGH ROLLING MACHINE HAVING DRIVEN DOUGH ROLLERS

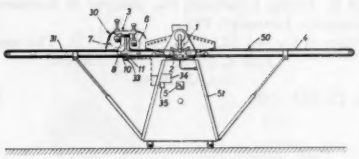
Hans-Joachim Jager, Burgdorf, Switzerland, assignor to Gustave Auguste Seewer, Burgdorf, Switzerland

Division of Ser. No. 159,633, July 6, 1971, abandoned. This application Nov. 6, 1972, Ser. No. 304,118

Claims priority, application Germany, Nov. 20, 1970, 2057212

Int. Cl. A21c *11/04*

U.S. Cl. 425—161 **5 Claims**



1. The combination with a dough rolling machine having two superimposed dough rollers and a respective conveyor band disposed to each side of said pair of rollers, and a drive mechanism for driving said rollers at selectively adjustable rotational speeds, of an auxiliary apparatus for cutting- and punching- out dough bands, said auxiliary apparatus comprising a cutting mechanism mountable at one of said conveyor bands, said cutting mechanism embodying a shaft, a pair of actuation levers seated upon said shaft, a pair of support rod members, each of said support rod members being pivotably mounted at its lower end with an associated one of said actuation levers, a pair of carrier elements, each of said carrier elements being attached to the upper end of an associated support rod member, at least one threaded spindle mounted at each carrier element for actuation so as to be movable up and down, a support at the lower end of each threaded spindle, at least one cutting tool rotatably mounted in each said support and movable between a lower working position and an upper rest position, and means for automatically shifting said drive mechanism to a lower rotational speed upon adjustment of the cutting tools from their rest position into their work position.

3,860,375
BLOW MOLDING APPARATUS

William G. Kinslow, Jr.; Paul A. Marchant, both of Kansas City, Mo.; Robert D. Bessier, Prairie Village, and Robert X. Hafele, Overland Park, both of Kans., assignors to Ethyl Development Corporation, Kansas City, Mo.

Continuation of Ser. No. 232,666, March 8, 1972, abandoned. This application Mar. 4, 1974, Ser. No. 447,826

Int. Cl. B29d *23/03*

U.S. Cl. 425—182 **14 Claims**

1. In an apparatus for extrusion blow molding plastic containers:

a. means supplying downwardly extruded, tubular parisons of moldable plastic material at a parison supply station;

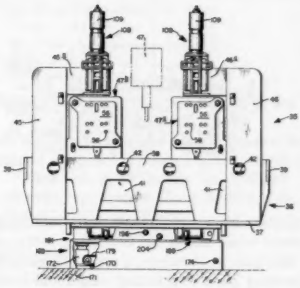
b. a first means for transversely moving with respect to the axis of said parisons a first pair of blow mold halves to said parison supply station to receive a first parison and to return said parison to a first blow station;

c. a second means for transversely moving with respect to the axis of said parisons a second pair of blow mold halves to said parison supply station to receive a second parison and to return said parison to a second blow station;

d. means carried by said first and said second means for transversely with respect to the axis of said parisons moving said first and second pair of blow mold halves for opening and closing said blow mold halves;

e. a first fixedly mounted blow assembly positioned to engage said first pair of blow mold halves at said first blow station to expand the enclosed parison;

f. a second fixedly mounted blow assembly positioned to engage said second pair of blow mold halves at said second blow station to expand the enclosed parison;



g. the assemblies and means of subparagraphs b) through f) being mounted on a portable first support means which is separate from second support means on which the means of subparagraph a) is mounted; and

h. third support means for supporting said first portable support means, said third support means being adjustable to position said first portable support means in relation to said second support means.

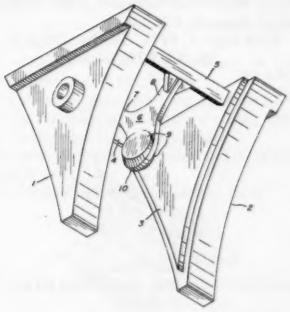
3,860,376
FEED DISTRIBUTOR FOR ROLL BRIQUETTING MACHINE

Stanley H. Cohlmeyer, Caracas; Wade H. Harrell, Puerto Ordaz, both of Venezuela, and William A. Knepper, Franklin Township, Westmoreland County, Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 3, 1973, Ser. No. 421,191

Int. Cl. B29c *15/00*; **B30b** *11/18*

U.S. Cl. 425—237 **3 Claims**



1. Device for distributing material forced into the nip of a roll briquetting machine comprising a solid metal diverter in the shape of a cylinder or two base-abutted cones truncated at angles of from about 55° to about 80° from the vertical, and means for supporting the diverter above the nip of the rolls.

3,860,377

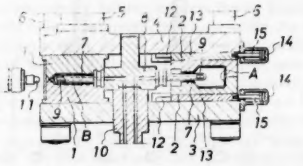
AN INJECTION-BLOW MOLDING APPARATUS INCLUDING PRODUCT EJECTOR MEANS

Kataski Aoki, 6037 Oaza Minamijo, Sakaki-Machi, Japan

Division of Ser. No. 292,473, Sept. 26, 1972,. This application Dec. 13, 1973, Ser. No. 424,593

Int. Cl. B29c *5/06;* **B29d** *23/02*

U.S. Cl. 425—242 B **2 Claims**



1. An injection blow-molding apparatus including a parison forming metal mold and a blow-molding metal mold, each separable into two mold-halves, a mold clamping plate and a mold supporting plate supporting said mold-halves of said metal molds at opposing positions thereon, two pairs of guide rails fixedly mounted on the opposing surfaces of the mold supporting plate and the mold clamping plate, respectively, an injection nozzle directed to said parison forming metal mold, and a supporting plate for supporting molding cores on both sides thereof and rotatable around the axis of a shaft of said supporting plate so that the molding cores are transferred from said parison forming metal mold to said blow-molding metal mold, said guide rails being extended in parallel with the centrally located molding core wherein a constant distance is maintained in each pair of the guiding rails, two seating plates each supporting one mold-half of the blow-molding metal mold are inserted freely between said respective pairs of guide rails on the mold supporting plate and the mold clamping plate, and a plunger cooperable with a hydraulic cylinder having an end thereof fixed to a stationary member of the apparatus is fixed to each of the two seating plates.

3,860,378

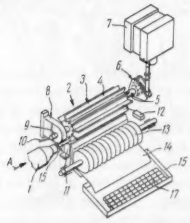
MACHINE FOR FABRICATING CYLINDRICAL GRANULES OF PASTY MATERIALS

Vladimir Nikolaevich Nefedov, ulitsa Zhely-abova, 13, kv. 45; Zinaida Petrovna Anokhina, Angarsky prospekt, 2, kv. 23; Vladimir Afanasievich Zimin, ulitsa Pushkina, 9/13, kv. 1, and Ardalion Dmitrievich Shirvatov, ulitsa Karla Marxa, 59, kv. 54, all of Angarsk, U.S.S.R.

Filed Sept. 7, 1972, Ser. No. 285,735

Int. Cl. B29c *24/00*

U.S. Cl. 425—302 **8 Claims**



1. A machine for fabricating cylindrical granules of pasty material, said machine comprising an extruder for extruding a string of pasty material, means adjacent said extruder for receiving said string therefrom to form cylindrical granules from said string, said means including: a throw-off drum with spaced radial blades thereon extending longitudinally along said drum; said string being fed from said extruder between the blades on said drum; a rotatable shaft supporting said drum; a ratchet gear coupled to said shaft for rotating the same; and an electromagnet connected to said ratchet gear to operate the same and thereby rotate said drum to discharge said string from said drum; a drive gear mounted on said shaft of the drum, and a cutting knife coupled to said drive gear for cutting said string between the extruder and the throw-off drum prior to discharge of the string from the blades of the drum.

3,860,379

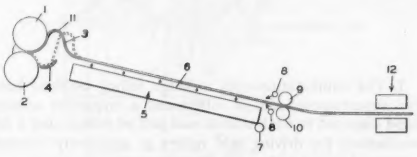
COOLING SLIDE

John H. Young, Lancaster, Pa., assignor to Armstrong Cork company, Lancaster, Pa.

Division of Ser. No. 243,271, April 12, 1972,. This application June 4, 1973, Ser. No. 366,466

Int. Cl. B29c *17/14*

U.S. Cl. 425—308 **2 Claims**



1. An apparatus for forming a product consisting of consolidating roll means which is used to convert bulk thermoplastic material into sheet form and push the formed sheet in an initial processing direction, including in the sheet processing direction beyond the consolidating roll means an inclined slide structure means with a top surface and an inlet and outlet end, said slide having a fluid medium flowing down the top surface of the slide, said formed sheet moving down the slide on the fluid medium from the inlet end to the outlet end of the slide, means at the outlet end of the slide for retarding movement of the sheet down the slide, said retarding means positively grasping and conveying the sheet from the slide at a speed less than the speed the sheet is fed onto the slide by the consolidating roll means, said speed difference being greater than that which would occur from just simple sheet size shrinkage such that the sheet is formed with a free-standing hump therein at the inlet end of the slide, said retarding means functions with the consolidating roll means and their speed difference to operate as a means to form beyond the retarding means an end product with compressive stresses therein and means provided for cutting the sheet into compressed state individual tile units.

3,860,380

APPARATUS FOR MAKING, FLATTENING AND HAULING-OFF BLOWN TUBULAR PLASTICS FILM

Hartmut Upmeier, Tecklenburg, Germany, assignor to Windmoller & Holscher, Munsterstrasse, Germany

Filed Nov. 20, 1972, Ser. No. 307,868

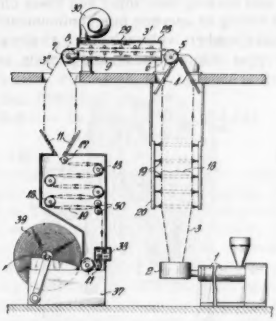
Claims priority, application Germany, Nov. 24, 1971, 2158337

Int. Cl. B29d *23/03*

U.S. Cl. 425—326 B **3 Claims**

1. Apparatus for making, flattening and hauling-off blown tubular film composed of plastic material comprising an extruder and vertically-upwardly operative blowhead means for receiving and inflating the plastic material with air to form film, the extruder portion of said extruder and blowhead means having a substantially horizontal longitudinal axis, first flattening means for the film provided vertically above the extruder and blowhead means downstream of a position at which the film has formed and solidified, direction-changing rolls at a spacing from one another for diverting the film through 180°, the direction-changing rolls being grooved to

permit the passage of inflating air from the extruder and blowhead means, second flattening means for the film, includng squeeze rolls, disposed at a spacing from and vertically below the downstream end of the direction-changing means, and supporting cylinders located between the direction-changing rolls for limiting inflation of the film, wherein the first flattening means and the direction-changing means are so arranged that a substantially vertical plane to the direction of movement of the film and through the direction-changing means is at an angle other than 0° or 180° to the direction of the longitudinal axis of the extruder portion of the extruder and blowhead means.



3,860,381

APPARATUS FOR THE PRODUCTION OF PRESSED BOARD

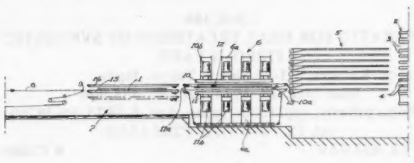
Jurgen Pesch, Krefeld, Germany, assignor to G. Siempelkamp & Co., Krefeld, Germany

Filed July 5, 1973, Ser. No. 376,926

Claims priority, application Germany, July 4, 1972, 2232720

Int. Cl. B29c *3/00*

U.S. Cl. 425—338 **9 Claims**



1. An installation for the production of pressed board, comprising:

a. a multiplaten press having a multiplicity of tiers each adapted to receive a compressed mat for the finish-pressing thereof into a board;

b. a charging rack adjacent said multiplaten press and having a number of levels corresponding to the number of tiers of said press, said levels each receiving a compressed mat for the simultaneous displacement thereof onto the respective tiers of said multiplaten press;

c. a two-opening prepress upstream of said rack and comprising:

c_1. a generally stationary intermediate platen,

c_2. an upper platen mounted above said intermediate platen,

c_3. a lower platen mounted below said intermediate platen, and

c_4. means for displacing both said upper and lower platens toward said intermediate platen to compress respective mats against said intermediate platen;

d. means for simultaneously feeding the compressed mats in said prepress onto respective levels of said charging rack;

e. a pair of stacked vertically displaceable conveyors upstream of said prepress and respectively alignable with openings thereof for advancing mats simultaneously into both openings of said prepress; and

f. means for feeding a succession of mats to said stacked conveyors at a predetermined level, said stacked conveyors being successively positionable at said predetermined level for receiving respective mats.

3,860,382

APPARATUS FOR THE MANUFACTURE OF CONTOURED RECORDS

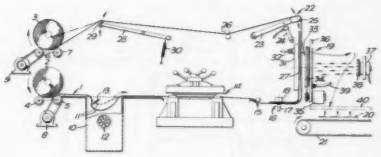
Basil Harry Royston Spiller, and Alan Phillipson, both of London, England, assignors to Decca Limited, London, England

Filed Feb. 9, 1973, Ser. No. 331,203

Claims priority, application Great Britain, Feb. 23, 1972, 8427/72; Oct. 17, 1972, 47703/72

Int. Cl. B29d *17/00*

U.S. Cl. 425—384 **8 Claims**



1. A press for pressing contoured records onto the face of a thermoplastic sheet, comprising:

a hydraulic pressure chamber;

a flexible conductive diaphragm forming one wall of said chamber;

means for securing the diaphragm rigidly around its perimeter;

a thin flexible conductive matrix fitting over said diaphragm;

means for supporting a sheet of thermoplastic material against said matrix;

means defining a narrow circular space in said pressure chamber behind said diaphragm;

means for alternately supplying hot and cold hydraulic fluid;

means for distributing said hydraulic fluid under pressure evenly to the periphery of said space;

means for providing egress of said fluid from the middle of said space; and,

means for intensifying pressure in said fluid.

3,860,383

SHEET EXTRUSION DIE OPENING RESTRICTION DEVICE

Paul Sirevicius, Chicago, Ill., assignor to Phillips Petroleum Company, Bartlesville, Okla.

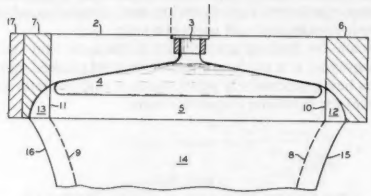
Filed Jan. 11, 1973, Ser. No. 322,694

Int. Cl. B29f *3/04*

U.S. Cl. 425—461 **3 Claims**

1. A coat hanger type sheet extrusion die having separable end plates for making the edges of extrudate uniform in thickness, texture, and color, said end plates comprising a slot

opening aligned with the extrusion slot of said extrusion die and of dimensions sufficient to allow increasing lateral measurement of the extrudate as said extrudate moves through said plates from the extrusion slot of said die.



3,860,384

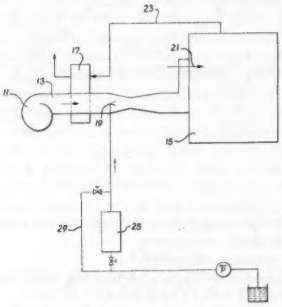
METHOD TO CONTROL NO FORMATION IN FOSSIL-UELED BOILER FURNACES

William G. Vulliet, Poway, and Wolfram G. Schuetzenduebel, Rancho Santa Fe, both of Calif., assignors to Intelcon Rad Tech, San Diego, Calif.

Filed May 25, 1972, Ser. No. 256,974

Int. Cl. F23j *7/00*

U.S. Cl. 431—4 **3 Claims**



1. A method for reducing the nitrogen oxide content of the flue gas of external combustion furnaces comprising preheating the combustion air and thereafter adding to said preheated combustion air prior to introduction of said preheated combustion air into a combustion chamber a predetermined level of moisture, said moisture being added at a level of from about 2 percent by weight to about 6 percent by weight of said combustion air, said combustion air being preheated to a temperature such that the relative humidity of the combustion air after addition of said moisture is less than about 25 percent and said moisture being fully evaporated prior to introduction of said combustion air into said combustion chamber.

3,860,385

CIGARETTE LIGHTER

Yoshitaka Nakanishi, 12-9, 5-chome Yawata, Ichikawa, Japan

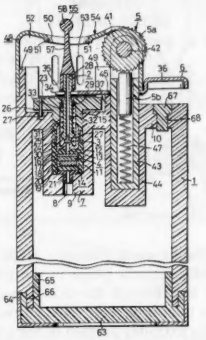
Filed Dec. 29, 1972, Ser. No. 319,171

Claims priority, application Japan, Dec. 29, 1971, 47-2954; Dec. 29, 1971, 47-4244; Sept. 11, 1972, 47-91100; Nov. 2, 1972, 47-127149; Nov. 17, 1972, 47-114702

Int. Cl. F23d *13/04*

U.S. Cl. 431—344 **3 Claims**

1. A gas lighter comprising a bottom-closed cylindrical valve casing, a valve cap threadedly connected within said valve casing, and a cylindrical packing accommodated within said valve casing, the outer peripheral surface of said cylindrical packing being in close sealing contact with the inner peripheral surface of said valve casing, similarly the upper end of said packing with the lower end of said valve cap, and the lower end of said packing with the bottom wall of said valve casing respectively so as to provide a valve chamber closely sealed by said valve casing and the valve cap, and in which said cylindrical packing is provided with a barrier wall for separating said packing into upper and lower chambers, said barrier wall having an aperture intercommunicating the upper and the lower chambers with each other, a valve seat mounted within said upper chamber and on said packing, and said lower



chamber accommodating therewithin at least two layers of reducing disks for reducing the velocity of gas flow having gas permeability together with elasticity and a barrier disk having gas impermeability together with rigidity inserted between said reducing disks, a nozzle displaceable in upward and downward directions having the lower end thereof inserted into said valve chamber and the other end thereof staying at the outside of the valve chamber, and a valve seal member fixed at the lower end of said nozzle for opening and closing gas passage to the nozzle by contacting with and separating from said valve seat due to the displacement of said nozzle.

3,860,386

APPARATUS FOR HEAT TREATMENT OF SYNTHETIC FIBROUS YARN

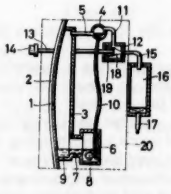
Nobuhisa Kodaira, 1-1-10 Shoan, Tokyo, Japan

Filed Mar. 29, 1974, Ser. No. 455,966

Claims priority, application Japan, Apr. 3, 1973, 48-39769

Int. Cl. F27b *9/28;* **F28d** *15/00*

U.S. Cl. 432—59 **4 Claims**



1. Heat treatment apparatus for synthetic fibrous yarn consisting of a plurality of elongate vessels arranged in parallel spaced relation to one another, each presenting a surface over which yarn is to be passed, the upper portion of each vessel communicates to an upper common pipe and lower portion of each vessel communicates to a lower common pipe, a heater provided in said lower common pipe, the vessels are filled with heat medium liquid in an amount that the heater is submerged, said apparatus comprising:

A. A gas reservoir having cooling wall and connected to the upper common pipe,
B. A valve provided in the way between said upper common pipe and gas reservoir,
C. A narrow tube for exhausting accumulated material, one end of which is connected to the bottom of said reservoir and the other end is closed.

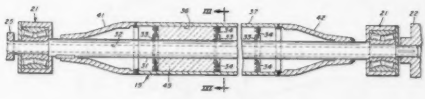
3,860,387

ROLLER FOR SUPPORTING A WORKPIECE IN A FURNACE OR THE LIKE

Francis H. Bricmont, Pittsburgh, Pa., assignor to Bricmont & Associates, Inc., Pittsburgh, Pa.

Filed Nov. 9, 1973, Ser. No. 414,443
Int. Cl. F27b *9/14*
U.S. Cl. 432—246 **10 Claims**

1. In combination with a heating furnace for metallic workpieces, a hearth including rollers for supporting at spaced-apart location such workpieces in a manner to avoid localized cooling of the workpieces during heating thereof, said rollers comprising an elongated arbor having an internal opening extending in an axial direction of the arbor for the passage of coolant, bearing means for rotatably supporting the ends of the arbor, an elongated sleeve member having an essentially continuous outer cylindrical face surface for uniform support and engagement along the length thereof with a workpiece during heating to an elevated temperature, said sleeve member having an internal diameter essentially larger than the outer diameter of said elongated arbor for providing an annular space therebetween to form a thermal barrier, and support means carried at spaced locations along said arbor for extending into a load transferring relation with said internal surface of the sleeve member, said support means at each location along the arbor including a plurality of support segments

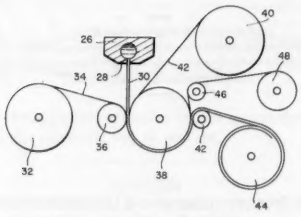


spaced one from the other along said arbor and extending radially in an essentially discontinuous and non-overlapping relation for reduced heat transfer in such a manner so as to improve creep resistant properties of the sleeve member arising out of the segmented support thereof at each location along the length of the arbor while transferring the load imposed by a workpiece during heating within said furnace.

3,860,388
DISPERSE DYE TRANSFER THROUGH POLYOLEFIN RELEASE LAYER TO NON-POROUS THERMOPLASTIC SHEET DYED THEREBY

John M. Haigh, 36 Lowell St., Peabody, Mass. 01960

Filed Sept. 25, 1972, Ser. No. 291,657
Int. Cl. D06p *1/76*
U.S. Cl. 8—2.5 12 Claims



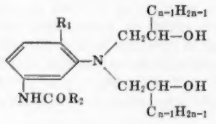
1. A method for transferring patterns to dye receptor thermoplastic non-porous sheet, comprising interposing a polyolefin sheet between a dye transfer sheet containing dispersed dyes and said dye receptor thermoplastic sheet; pressing said sheet together to obtain close contact therebetween; heating the pressed sheets to a sublimation temperature for the dyes and to a softening point of said polyolefin sheet; maintaining said sheets at said temperature until a substantial portion of said dyes have sublimed and transferred through said polyolefin sheet to said dye receptor sheet; cooling said sheets below the softening temperature of the polyolefin sheet and dye receptor sheet and separating said dye receptor sheet from the pressed materials.

3,860,389
POLYESTER FABRIC DYED WITH A NITROBENZOTRIAZOLE-AZO-(DIHYDROXYALKYLAMINO)-ACYLANILIDE ACYLATED IN AN ALKYLAMIDE SOLUTION

Edgar E. Renfrew, Flemington, Pa., assignor to American Aniline Products, Inc., Paterson, N.J.

Filed June 28, 1973, Ser. No. 374,771
Int. Cl. D06p *3/54*
U.S. Cl. 8—26 5 Claims

1. A polyester fabric material dyed with a monoazo dyestuff consisting essentially of the reaction product of
   a. the diazotized base of 7-amino-4-nitrobenzotriazole; and
   b. a coupling component of the formula



wherein
R_1 is H or lower alkoxy;
R_2 is an alkyl radical having 1–4 carbon atoms, phenyl, tolyl, or chlorophenyl; and
n has a value of 1–2, the hydroxyalkyl groups being reacted with at least stoichiometric quantities of both:
1. a lower alkyl chlorocarbonate, lower alkanoyl chloride, benzoylchloride, methylbenzoylchloride, ethylbenzoyl chloride, phthaloyl chloride, isophthaloyl chloride, terephthaloyl chloride or lower alkylsulfonyl chloride, and
2. a mono- or di-lower alkyl formamide or acetamide, at a temperature of 30°–100° C. until the reaction mixture is substantially free of unreacted coupling component.

3,860,390
DYE COMPOSITION OF BENZYL ALCOHOL, PHENYL GLYCOL ETHER AND OCTYLPHENYL PENTAGLYCOL ETHER

Wolfgang Lindemann, Mondenweg 24, 51 Inzlingen, Germany

Filed Apr. 17, 1973, Ser. No. 351,837
Claims priority, application Switzerland, Apr. 17, 1972, 5636/72
Int. Cl. D06p *1/82*
U.S. Cl. 8—93 6 Claims

1. A composition for use as an assistant for printing pastes or dyeliquors, which consists essentially of (*a*) 1 to 30% by weight of octylphenyl pentaglycolether, (*b*) 20 to 70% by weight of benzyl alcohol, and (*c*) 29 to 80% by weight of monophenyl glycolether, totalling 100% by weight.

3,860,391
BLEACHING OF CELLULOSE CONTAINING TEXTILE FIBER MATERIAL WITH A SILICATE-FREE STABILIZED PEROXIDE BLEACHING BATH

Alfred Kling, Ladenburg; Viktor Specht, Dossenheim; Carmen Hofstetter, Mannheim-Kaefertal, and Gundolf Eisenberg, Hemsbach, all of Germany, assignors to Benckiser-Knapsack GmbH, Ladenburg Necker, Germany

Filed Mar. 7, 1973, Ser. No. 338,863
Claims priority, application Germany, Mar. 10, 1972, 2211578
Int. Cl. D06l *3/02*
U.S. Cl. 8—111 11 Claims

1. In a process of bleaching cellulose containing textile fiber material with a peroxide containing bleaching bath, the improvement which consists in
   1. providing a peroxide-containing bleaching bath free of silicate and adjusted to a pH between about 9.0 and about 12.0;
   2. adding to said bath a stabilizing agent consisting of a mixture of
      a. an aliphatic hydroxy compound with 2 to 6 carbon atoms in its hydrocarbon chain, and
      b. a phosphonic acid compound selected from the group consisting of an amino alkylene phosphonic acid, a hydroxy alkane phosphonic acid, a water soluble salt of said phosphonic acids, and mixtures thereof, and
   3. bleaching the cellulose-containing textile fiber material with said stabilizing agent containing bath without substantially reducing the degree of polymerization of the cellulose present in the fiber material.

3,860,392
COLORANT COMPOSITIONS AND METHOD

Claude Renault, and Michel Sleghem, both of Antony, France, assignors to Pechiney-Saint Gobain Produits Chimiques, Neuilly-sur-Seine, France

Filed Jan. 20, 1971, Ser. No. 108,229
Claims priority, application France, Feb. 6, 1970, 70.04252; Oct. 23, 1970, 70.38314; Feb. 6, 1970, 70.04253
Int. Cl. D06p *5/04*
U.S. Cl. 8—169 15 Claims

1. A process for the preparation of a colorant composition dispersible in an organic solvent medium from dyes dispersible in an aqueous medium but insoluble and non-dispersible in an organic solvent medium, comprising incorporating in a concentrated aqueous dispersion of the dye a solution of an emulsifying agent selected from the group consisting of a long chain alkylbenzene sulfonate and a dialkyl sulfosuccinate ethanol amine salt and a nonionic alkylphenol-ethylene oxide

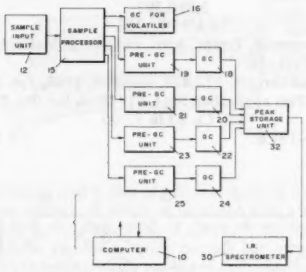
condensate solution, and mixing the resulting mixture with a phosphated long chain alkylphenolalkylene oxide condensate in a one carbon or two carbon chlorinated hydrocarbon to produce a composition in which the dye is contained in the chlorinated hydrocarbon.

3,860,393

AUTOMATED SYSTEM FOR IDENTIFYING TRACES OF ORGANIC CHEMICAL COMPOUNDS IN AQUEOUS SOLUTIONS

Charles F. Campen, Jr., Arcadia, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Feb. 22, 1972, Ser. No. 227,977
Int. Cl. G01n *33/00*, *31/08*
U.S. Cl. 23—230 R **6 Claims**



1. An automated chemical compound identification system comprising:

a sample processor means for extracting chemical compounds from a sample supplied thereto into a plurality of families of chemical compounds contained in said sample in a controlled sequence of steps, at least N of said families being dissolved as extracts in appropriate solvents, N being at least two;

first means including N chromatograhic columns, each being responsive to a different one of said N families for separating the compounds in the family from one another and for providing chromatographic data for each compound to be identified;

computer means including means controlling the sequence of steps in said sample processor means and said first means including means for storing chromatographic and spectral data of each of a plurality of known chemical compounds defining a compound repertoire, means for comparing the chromatographic data provided by said first means for each compound separated in any of said N columns to be identified with the chromatographic data of said known compounds for selecting unidentified compounds of interest;

a single spectrometer; and

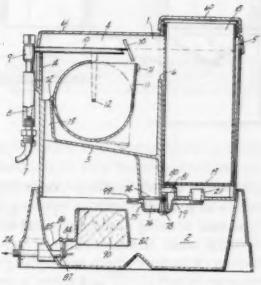
compound storage means connected to said N chromatographic columns and said spectrometer, said compound storage means comprising a plurality of holding columns for transferring to said spectrometer any compound of interest received from any of said N chromatographic columns for spectral analysis and for holding any compound of interest received from any of said N chromatographic columns when another compound of interest is being analyzed by said spectrometer, the time of analysis of a compound by said single spectrometer is greater than the expected shortest time between the successive exits of two compounds of interest from any two of saids N chromatographic columns, with the spectral data of each compound provided by said spectrometer being supplied to said computer means to identify a compound based on at least its spectral data from said spectrometer.

3,860,394

APPARATUS FOR DISSOLVING AND DISPENSING SOLUBLE SOLID MATERIAL

Joseph J. Tepas, Jr., Easton, Conn., and Arlon G. Sangster, Sterling, Mass., assignors to Olin Corporation, New Haven, Conn.

Filed Sept. 4, 1973, Ser. No. 394,007
Int. Cl. B01d *11/02*
U.S. Cl. 23—267 E **16 Claims**

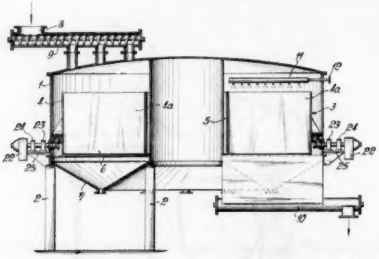


1. In an apparatus for dissolving and dispensing soluble solid material including in combination a closed container having an upper chamber and a lower chamber and at least one partition separating said chambers, said upper chamber having a first and a second compartment separated by a divider; an inlet for liquid in the upper part of said first compartment, a rotary receptacle in said first compartment and attachment means therefore comprising a pair of trunnions, said receptacle receiving said liquid from said inlet and upon rotation periodically emptying said receptacle; first flow control means associated with at least one opening for controlling liquid flow between said first compartment and said second compartment; a magazine in said second compartment to hold soluble solids, said magazine having a pervious lower end permitting said liquid to contact the lower portion of said solids, a first opening for liquid flow between said second compartment and said lower chamber, an outlet in said lower chamber and second flow control means for liquid flow through said outlet, the improvement which comprises: said first compartment having an opening in said partition separating said upper chamber from said lower chamber, said second compartment having a second opening in said partition separating said upper chamber from said lower chamber, and said first flow control means controlling liquid flow between said opening in said first compartment and said second opening in said second compartment, said first flow control means between said opening is said first compartment and said second opening in said second compartment comprising a rotary member having a pivotal attachment to the underside of said partition between said upper chamber and said lower chamber, said rotary member having a cup positioned eccentric to said pivotal attachment, said cup having a lip of sufficient diameter to encompass said openings in said first compartment and said second compart, whereby liquid can flow from said first compartment to said second compartment.

3,860,395
ROTARY EXTRACTOR

Wolfgang Kehse, Ahrensburg, and Klaus Weber, Hamburg, both of Germany, assignors to Extraktionslechnik Gesellschaft fur Anlagenbau mbH, Hamburg, Germany

Filed Dec. 4, 1972, Ser. No. 311,677
Claims priority, application Germany, Dec. 3, 1971, 2160014
Int. Cl. B01d *11/02*
U.S. Cl. 23—269 9 Claims

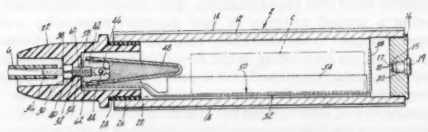


1. In an extractor, a combination comprising a housing having a bottom wall provided with an opening; a star-shaped rotor turnable in said housing about a vertical axis and having a plurality of radial walls adjacent ones of which define respective extraction chambers which serially register with said opening in response to turning of said rotor; a ring-shaped rail fast with and surrounding said rotor within said housing for movement with said rotor, said rail having a radially outer upright circumferential surface portion; a plurality of shafts angularly spaced about said housing and each defining a fixed axis of rotation; a plurality of supporting rollers arranged interiorly of said housing each mounted on one of said shafts and being turnable about the respective fixed axis, said rail being supported on said rollers and the latter each having a flange extending transversely of the respective fixed axis of rotation and being located radially outwardly adjacent said circumferential surface portion so as to center said rail and thereby said rotor in said housing; journal means journalling the respective shafts and rollers for rotation and being wholly located exteriorly of said housing; and drive means for turning said rotor about said vertical axis, said extractor having no bearings located within the housing, and said rail and rollers being the sole support and centering means for the rotor.

3,860,396
OXYGEN GENERATOR

Carl E. Finley, Sycamore, Ill., assignor to Olin Corporation, New Haven, Conn.

Filed Aug. 13, 1973, Ser. No. 387,834
Int. Cl. A61m *15/00*; B01j *7/00*
U.S. Cl. 23—281 1 Claim



1. An oxygen generating device for use with a combustable oxygen-producing candle, said device comprising:

a. a generally tubular housing having a hollow interior and an open end portion;

b. a cap removably secured to said open end portion of said housing to close the latter;

c. fitting means providing a fluid passage through said cap to allow oxygen gas to exit from said housing interior;

d. check valve means including a valve housing secured to said fitting means for controlling oxygen gas flow from said housing;

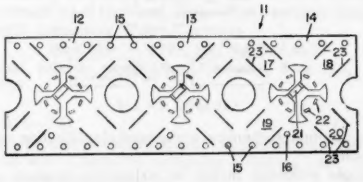
e. a tray disposed in said housing interior for supporting a candle during combustion thereof, said tray including a portion thereof sandwiched between said cap and said valve housing whereby said tray is secured to said cap and removed from said housing interior when said cap is withdrawn from said open end portion of said housing; and

f. a hollow filter member having an open basal portion which is telescoped over and removably mounted on said valve housing to filter oxygen gas flowing from said housing.

3,860,397
LEAD FRAME

Eugene E. Segerson, Tempe, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Division of Ser. No. 722,471, April 18, 1968, Pat. No. 3,560,808. This application Sept. 11, 1970, Ser. No. 71,369
Int. Cl. B32b *15/00*
U.S. Cl. 29—191.6 7 Claims



1. In a one-piece lead frame of a substantially flat electroconductive material having a plurality of sections over the length thereof with each section usable for the assembly of a semiconductor device, the combination in each section of said lead frame of an open central area, a plurality of lead portions spaced from one another and extending radially outwardly from said central area and defined in said material of the section by precutting the material, to define said plurality of lead portions with a pair of said lead portions having a portion of the lead frame material connecting the same with excess portions of the material adjacent to each lead portion remaining in the lead frame during assembly steps for the semiconductor device, with each said lead portion having an inner end portion and an outer end portion with the latter adapted for the outside connection from the semiconductor device, said connecting portion of the lead frame material comprising a self-supporting conductive bridging portion integral with and connecting pair of said lead portions at the inner end portion of each shaped so that the greater portion of said bridging portion is in a plane spaced axially away from the plane of said material through said central area, with each section of the lead frame adapted to have a semiconductor unit with electrodes on a face thereof mounted on an insulating base member at the opening in said central area, whereby a wire conductor can be extended from an electrode directly to said bridging portion in a short conductive connection to minimize the inductance of a circuit comprising the combination of such electrode, a conductor, the bridging portion, and the lead pair of portions integral with said bridging portion, with other lead portions in a lead frame section and said pair of lead portions being so constructed as to be mountable upon the insulating base member in the assembly of a semiconductor device for insulating separation of said pair of lead portions from said other lead portions, and all said lead portions and said excess portions of a section in the lead frame being sepa-

rable relative to the material of the lead frame in the assembly of a semiconductor device.

3,860,398

CAN PRODUCED FROM CHROMIUM-COATED STEEL PLATE

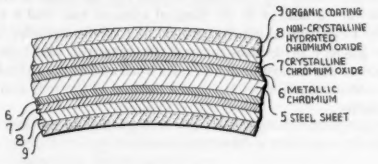
Michiko Tsurumaru; Hiroshi Matsubayashi, both of Tokyo; Hiroki Sano, Yokosuka; Yukio Suzuki, Yokohama, and Hiroshi Ueno, Yokosuka, all of Japan, assignors to Toyo Seikan Kaisha Limited, Tokyo, Japan

Filed Nov. 30, 1973, Ser. No. 420,651

Claims priority, application Japan, Dec. 5, 1972, 47-121213

Int. Cl. B32b *15/04*

U.S. Cl. 29—195 **9 Claims**



1. A can at least a part of which is made of a steel sheet at least one surface of which is provided with a three-layered chromium coating consisting of a metallic chromium coating, a crystalline chromium oxide coating and a non-crystalline hydrated chromium oxide coating in this order beginning with the surface of the steel sheet.

3,860,399

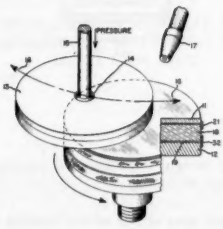
LIQUID BLOCKING TECHNIQUE FOR WORKING A MEMBER TO PRECISE OPTICAL TOLERANCES

Milton L. Noble, Liverpool, and Edmund H. Schindler, Newark, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Dec. 7, 1972, Ser. No. 313,157

Int. Cl. B24b *1/00, 7/24*

U.S. Cl. 51—283 **9 Claims**



1. The method of working a thin work piece to precise optical tolerances employing a polishing apparatus, comprising the steps of:

a. preparing a rigid non-porous substrate having a surface configuration of desired accuracy;

b. finishing the first surface of said work piece to said desired surface configuration to a first order of accuracy;

c. supporting the workpiece by said first surface upon said substrate by a liquid means confined between said first surface and the surface of said substrate providing a thin capillary film of at least several microns in thickness which provides a low stress, compliant support to said work piece, said film causing the work piece and the support to adhere to one another and to resiliently oppose compressive forces inducing relative motion perpendicular to their adjoining surface, said support means further including solid means engaging said work piece for restricting relative motion along said adjoining surfaces; and

d. working the second and opposite surface of said work piece to a higher, second order of accuracy.

3,860,400

FLEXIBLE ABRASIVE COVERINGS

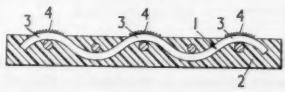
Derek Henry George Prowse, and Stephen Derek Prowse, both of Batts Hill, Redhill, Surrey, England, assignors to D. H. Prowse and Company Limited, Surrey, England

Filed July 17, 1972, Ser. No. 272,116

Claims priority, application Great Britain, July 27, 1971, 35103/71

Int. Cl. B24d *11/02, 3/08*

U.S. Cl. 51—295 **18 Claims**



1. An abrasive article comprising backing material, a metallic sheet embedded in said backing material so that spaced portions of said sheet are exposed on a surface of said backing material, and abrasive particles bonded to said exposed portions of said sheet.

3,860,401

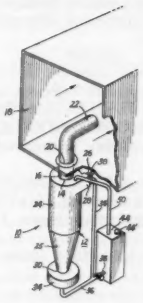
METHOD AND DEVICE FOR PRODUCING DRY VAPOR

Charles W. Clark, Dumont; John M. Paulovich, Ridgefield Park, and William Perlberg, Wyckoff, all of N.J., assignors to Airwick Industries, Inc., Carlstadt, N.J.

Continuation-in-part of Ser. No. 338,447, March 6, 1973, abandoned. This application June 25, 1973, Ser. No. 373,290

Int. Cl. B01d *47/06*

U.S. Cl. 55—89 **21 Claims**



1. The method of treating air with dry vapor particles, with the aid of a vortex separator, which method comprises producing a spray mist of liquid air-treating agent having vapor particle sizes from less than one micron to at least several microns, introducing said spray mist tangentially into said vortex separator at the upper end of the separator, directing said spray mist in said separator along a spiral flow path to cause the larger of said particles to gravitate towards the periphery of said path and the vapor particles of one micron or less to remain adjacent the center of said path, removing said vapor particles from adjacent the center of said path, and introducing said vapor particles into the air to be treated; said step of producing a spray mist comprising the step of aspirating liquid air-treating agent in an air spray nozzle by passing air through said nozzle.

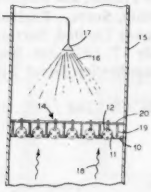
3,860,402
ABSORPTION OPTIMIZATION

Steven S. Strom, and Henry P. Markant, both of Alliance, Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.

Division of Ser. No. 130,738, April 2, 1971, Pat. No. 3,749,380. This application Mar. 22, 1973, Ser. No. 343,995

Int. Cl. 55 *233;* **B01d** *53/14*

U.S. Cl. 55—90 **3 Claims**



1. In the process of absorption between a liquid and a gas wherein a contact zone is provided for flow of liquid downwardly and gas upwardly therethrough, the lower end portion of the contact zone being restricted flow wise by a plurality of spaced openings, a plurality of spheres corresponding in number with and having a dimension greater than the spaced openings, each of the spheres being substantially of the same dimensions and having selected different weights, and each sphere being limited in vertical movement by a plurality of vertical rods forming a defined lineal path several times the diameter of the sphere and having hardly any horizontal breadth, the improved method of operation comprising maintaining a substantially uniform flow of liquid downwardly into said contact zone, and regulating the upward flow of gas into said contact zone between a maximum flow rate fluidizing all of said spheres in the contact zone with all of the spaced openings being open for gas and liquid flow therethrough and at a minimum flow rate fluidizing only the lightest weight spheres with only the spaced openings corresponding with the light weight spheres being open for flow therethrough whereby a substantially constant holdup of liquid is attained in the contact zone for optimum absorption efficiency during liquid and gas contact.

3,860,403
EXHAUST GAS PURIFYING APPARATUS FOR INTERNAL COMBUSTION ENGINES

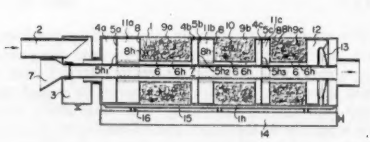
Katashi Aoi, No. 840, Juniso, Kanagawa-ken, Kamakura-shi, Japan

Continuation-in-part of Ser. No. 207,772, Dec. 14, 1971, abandoned. This application Aug. 14, 1973, Ser. No. 388,183

Claims priority, application Japan, Oct. 13, 1972, 47-117697

Int. Cl. B01d *50/00*

U.S. Cl. 55—269 **1 Claim**



1. An exhaust gas purifying apparatus for an internal combustion engine comprising a cylinder divided into a plurality of successive stages for expansion, condensation and collection of impurities, each such stage having successively in the direction of gas flow (a) an annular expansion chamber and (b) annular condensation chamber separated from one another by an annular perforated adiabatic plate, and (c) an annular collecting chamber separated from the condensation chamber by an annular perforated wall and containing a heat resistant collecting material, means transmitting the exhaust gas received from the engine to an annular expansion chamber of a first stage located at a forward end of the cylinder, the exhaust gas flowing through this stage being delivered from the annular collecting chamber to the annular expansion chamber of the next succeeding stage and passing in like manner from succeeding stage to succeeding stage to be delivered to the annular expansion chamber of the last of said stages located at the rear end of the cylinder, second means delivering an exhaust portion of said cylinder and located at the rear end thereof, the annular collecting chamber of said last stage delivering exhaust gas to said exhaust portion, the volume of the chambers and the size of the perforations in said adiabatic plates progressive decreasing from stage to stage the direction from the first stage toward the last stage to compensate for variations in the flow of exhaust gas, and a cooling tube extending along the central axis of the cylinder to cool the gas as it progresses through the apparatus said tube being open to the atmosphere at the forward end of the cylinder and in communication with exhaust portion at the rear end of the cylinder.

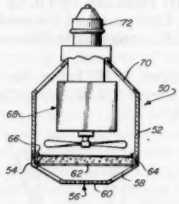
3,860,404
FILTER APPARATUS WITH MOVEMENT MEANS

Stefan Jochimski, 30 E. Oak St., Chicago, Ill. 60611

Filed Feb. 21, 1973, Ser. No. 334,272

Int. Cl. B01d *27/02*

U.S. Cl. 55—385 **5 Claims**



1. A small, lightweight apparatus for moving air to be filtered therethrough, including

a housing,

a perforate entry area at one of the housing ends,

an electric suction fan means positioned within the housing, an electrical male connection plug on one end of the housing, to engage a female electrical socket,

a removable filter-material container positioned to one side of said electric suction fan to intercept the air moved by said electric suction fan,

a perforate outlet area on said housing on the other side of said electric suction fan means, said filter container held easily in a user's hand and such filter container positioned within the cap and being removable with said cap, said filter material being activated charcoal, and

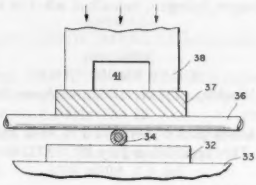
a cap releasably mounted on the end of the housing opposite to the end with the male connection plug, in such a manner so as to be openable and closeable by a user's hand to disengage and engage the end of the housing to quickly remove and replace said filter-material with a user's hand.

3,860,405

BONDING OF OPTICAL COMPONENTS

Alexander Coucoulas, Bridgewater Township, Somerset County, and Franklin Winston Dabby, Ewing Township, Mercer County, both of N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Nov. 13, 1972, Ser. No. 306,243
Int. Cl. C03b 23/20
U.S. Cl. 65—42 5 Claims



1. A method of splicing first and second glass waveguides to couple optical energy therebetween with a minimum of scattering, comprising the steps of:

orienting said first waveguide on a glass substrate;

orienting said second waveguide on the substrate so that the free end thereof is adjacent the free end of said first waveguide; and

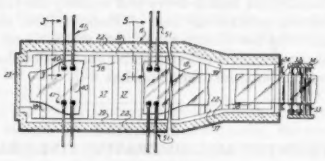
applying sufficient mechanical, thermal and/or vibratory energy to said waveguides and said substrate to raise said waveguides and said substrate to a temperature falling between the transformation temperature and the softening temperature of the waveguide to bond said waveguides to the substrate, whereby the relative alignment between the free ends of the waveguides is maintained, even in the presence of forces tending to disturb the alignment.

3,860,406

METHOD OF MANUFACTURING GLASS

Wayne G. Basler, Ile, and Robert J. Thompson, Monroe, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 674,605, Oct. 11, 1967, abandoned. This application Feb. 24, 1970, Ser. No. 14,728
Int. Cl. C03b 18/02
U.S. Cl. 65—91 8 Claims



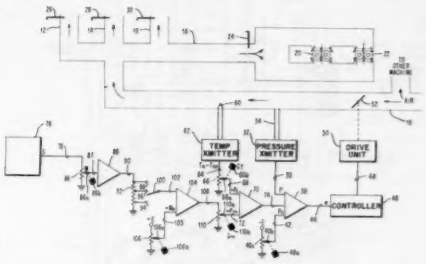
1. A method for producing glass which comprises: melting glass forming materials in a glass melting furnace; delivering said molten glass to the surface of a molten metal bath contained in a cavity formed by refractory material housed in a substantially enclosed chamber thereby to supply a pool of molten glass formed on said metal bath at the upstream entrance end of said chamber; applying in said pool of glass a propellent force to said glass to push a prescribed quantity of molten glass out of said pool in a direction generally downstream of said chamber; flowing said propelled glass toward an equilibrium thickness; and cooling said glass to form a self-supporting ribbon of glass.

3,860,407

CONTROL SYSTEM FOR MOLD COOLING IN GLASS FORMING MACHINE

Harry A. Fertik, Philadelphia, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Filed June 18, 1973, Ser. No. 371,098
Int. Cl. C03b 25/04
U.S. Cl. 65—161 2 Claims



1. A control system for maintaining a constant temperature for the parisons formed in a glass forming machine where the parisons are subject to air cooling by the blowing of cooling air from a duct onto the mold for the parisons, comprising:

means for changing the pressure of the cooling air in the duct,

means for measuring the pressure of the cooling air in said duct,

control means operable in response to the deviation of said pressure measurement from a set point value to control said pressure by controlling the operation of said first named means,

means for measuring the temperature of said cooling air, and

means responsive to changes in said temperature measurement for directly varying the deviation to which said control means is responsive so as to cause said control means to vary the pressure in said duct to maintain a substantially constant temperature for said parisons as said temperature of said cooling air changes.

3,860,408

GLASS ROD SLUG MOLDING MACHINE

Emil A. Mastik, Guttenberg, N.J., assignor to Kahle Engineering Co., Union City, N.J.

Filed Dec. 12, 1973, Ser. No. 424,054
Int. Cl. C03b 9/46
U.S. Cl. 65—174 8 Claims

1. An improved means for molding small glass articles from glass rods comprising the combination of:

a rotatably mounted mold support disc;

a plurality of mold supports mounted in spaced relation around the periphery of said disc;

a glass loading station positioned at said disc;

a molding station positioned at said disc;

drive means for said disc for stepping said mold supports successively to said loading and molding stations;

a plurality of glass charge supplying means each including a glass rod feeder positioned adjacent to said loading station;

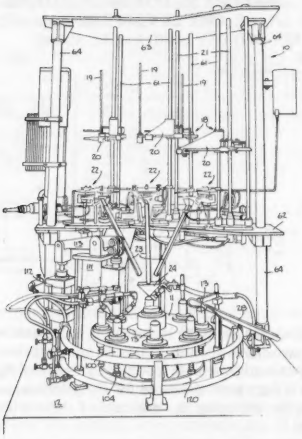
means for heating the lower ends of each glass rod;

means for cutting molten glass charges from the heated lower ends of the rods and for directing the charges to the loading station;

said mold supports each mounting a lower mold section;

actuating means including timing means coupled to said disc drive means and to said rod cutting means for operating the cutting means for one rod feeder only for each stepped advance of the disc and for cutting the rods in succession whereby charges from successive rods are fed to successive lower mold sections;

an upper mold section positioned at the molding station; and



mold drive means positioned at said molding station for providing relative motion for said upper and lower mold sections for moving them together to mold said articles.

3,860,409

PROCESS FOR PREPARATION OF ACIDIC FERTILIZER CONTAINING SLAG

Harold W. Wilson, P.O. Box 9851, El Paso, Tex. 79989

Filed Nov. 29, 1972, Ser. No. 310,545
Int. Cl. C05d
U.S. Cl. 71—62 **7 Claims**

1. A process for making soil fertilizing and soil improveing gel products comprising the steps of:

a. intimately mixing a pulverized waste copper slag obtained from the reverberatory refining of copper ore with concentrated sulfuric acid having a strength, by weight, in the range from 95 to 98% H_2SO_4 in an acid-to-slag ratio, by weight, of at least 1:1 so as to thoroughly wet the slag and to substantially displace the air therefrom;

b. adding a quantity of water to said acid-wetted slag based upon the weight of said slag, whereby the ratio, by weight, of water-to-slag in the resulting slag-acid-water composition is in the range 1:4 to 1:5; and

c. allowing said slag-acid-water composition to react to form dry granular gel products containing large quantities of equivalent acid.

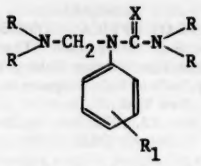
3,860,410

METHOD OF CONTROLLING UNDESIRED VEGETATION

Alexander Mihailovski, Berkeley, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

Division of Ser. No. 99,658, Dec. 18, 1970, abandoned. This application Apr. 26, 1972, Ser. No. 247,671
Int. Cl. A01n *9/12*
U.S. Cl. 71—99 **20 Claims**

1. The method of controlling undesirable vegetation comprising applying to the locus where control is desired an herbicidally effective amount of a compound having the formula:



wherein X can be oxygen or sulfur, R can be lower alkyl, R_1 can be hydrogen, halogen, haloalkyl, alkyl or alkoxy.

3,860,411

SUGAR PRODUCTION

Martin L. Weakley, Pryor, Okla., assignor to Nipak, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 135,811, April 20, 1971, abandoned. This application July 27, 1972, Ser. No. 275,863
Int. Cl. A01n *9/20*
U.S. Cl. 71—119 **19 Claims**

1. A method of increasing sucrose recoverable as crystalline sugar from a vegetable crop specifically grown to be processed for the recovery of crystalline sugar comprising applying to the growing plants of said crop an effective amount of biuret to cause an increase of sucrose content in said plants.

3,860,412

PROCESS FOR UPGRADING OF TITANIFEROUS MATERIALS

Halit Zafer Dokuzoguz, 27 Alzenauer Str., Rodenbach I, Germany, and George Leathwhite Roberts, Jr., 117 Wyngate Rd., Savannah, Ga. 46904

Filed July 16, 1973, Ser. No. 379,505
Int. Cl. C01g *23/02, 23/08*
U.S. Cl. 75—1 **5 Claims**

5. A process for beneficiating titaniferous material comprising the steps of:

a. digesting particles of said material with 1 to 1.6 parts of concentrated sulfuric acid per part of said material at elevated temperature to produce a digestion cake;

b. baking said digestion cake to convert about 25 to about 80 percent of the titanium values in the material to soluble titanium sulfates;

c. dissolving the baked digestion cake in water or dilute sulfuric acid to provide an aqueous slurry containing about 100 to 200 grams of titanium values (expressed as TiO_2) per liter;

d. boiling said slurry to precipitate substantially all the titanium values as filterable solids while leaving the dissolved iron in solution;

e. filtering the boiled slurry and washing the resulting precipitate substantially free of dissolved iron; and

f. calcining the washed precipitate at 700°C. to 1000°C. to produce calcined cake suitable for direct chlorination to produce titanium tetrachloride.

3,860,413

METHOD FOR AGGLOMERATING FINE-GRAIN IRON OXIDE MATERIAL

Karl Goran Gorling, Lidingo, and Johan Elof Wiklund, Halsingborg, both of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Continuation of Ser. No. 863,367, Oct. 2, 1969, abandoned. This application Apr. 12, 1972, Ser. No. 243,499
Claims priority, application Sweden, Oct. 16, 1968, 13972
Int. Cl. C21b *1/20*
U.S. Cl. 75—3 **4 Claims**

1. A process of agglomerating fine-grained iron oxide material into a coarse-grained product which lends itself to easy handling and transportation and which is suitable for further metallurgical treatment comprising adding as the sole lubricating agent water to said material in an amount of 1–6% by

weight of said material controlling the temperature of the moistened material to within the range of 55°–100°C, and agglomerating the material by rolling and compaction of same between substantially smooth rolls, under pressure at least sufficient that the heat of friction developed in the material is such as to effect vaporization of the water theretofore added, and thereby produce a dry strong agglomerate, said water being vaporized by the friction heat developed during the rolling.

3,860,414
USE OF GRAFT COPOLYMERS AS AGGLOMERATION BINDERS

William J. Lang, Libertyville, and John J. Krajewski, Wheeling, both of Ill., assignors to International Minerals & Chemical Corporation, Libertyville, Ill.

Filed Sept. 4, 1968, Ser. No. 757,471
Int. Cl. C08d *9/06;* **C21b** *1/26*
U.S. Cl. 75—3 **23 Claims**

1. In a method of agglomerating a wetted mass of a finely divided material, the improvement which comprises the step of adding to said wetted mass, prior to the agglomeration thereof, at least a binding amount of a water-soluble graft copolymer or a mixture of said graft copolymer and a bentonite clay, said graft copolymer being a graft copolymerization product of acrylic acid and from about 0.1 to about 10 percent by weight, based on the weight of said acrylic acid, of a polyhydroxy polymeric compound, or a water-soluble salt of said graft copolymerization product, said polyhydroxy polymeric compound being of the group consisting of:

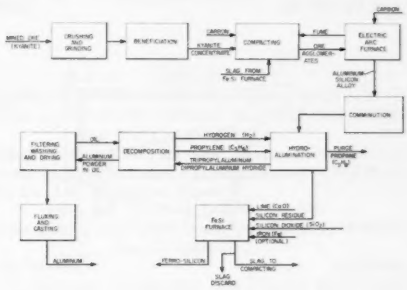
a. derivatives of cellulose of the group consisting of chlorohydroxypropyl cellulose, phenylhydroxyethyl cellulose, hydroxybutyl cellulose, hydroxyethyl cellulose, ethyl cellulose, hydroxyethyl methyl cellulose, hydroxypropyl methyl cellulose, and carboxymethyl cellulose,
b. starch,
c. derivatives of starch of the group consisting of chlorohydroxypropyl starch, phenylhydroxyethyl starch, hydroxybutyl starch, hydroxyethyl starch, ethyl starch, hydroxyethyl methyl starch, hydroxypropyl methyl starch, carboxymethyl starch, and methyl starch,
d. sugars,
e. causticized lignite,
f. biochemically-synthesized heteropolysaccharides,
g. polyvinyl alcohol,
h. polyalkylene glycols, and
i. alkoxy polyalkylene glycols.

3,860,415
PROCESS FOR PREPARING ALUMINUM

Marcelian F. Gautreaux; John H. McCarthy; Walter E. Foster; Donald O. Hutchinson, and Frederick W. Frey, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Aug. 2, 1972, Ser. No. 277,383
Int. Cl. C22b *21/00, 21/02;* **B22f** *9/00*
U.S. Cl. 75—.5 B **12 Claims**

1. A process for producing substantially pure aluminum from a raw kyanite ore, comprising, in sequence, the steps of:
a. comminuting the raw kyanite ore into particles about minus 35 mesh in size, then beneficiating the ore particles via flotation to remove micas, pyrites and quartz sand, and then magnetically separating iron species and garnet from the ore to form a particulated kyanite concentrate;
b. agglomerating the particulated kyanite concentrate into ore compactions of a predetermined size and shape;
c. carbothermically reducing the ore compactions in an electric arc furnace to produce an aluminum-silicon alloy and effluent fume, and recycling said effluent fume to the agglomerating step;
d. comminuting the aluminum-silicon alloy to a particle size of about minus 100 mesh;
e. hydroaluminating the particulated aluminum-silicon alloy utilizing propylene, hydrogen and a sodium catalyst to form tripropylaluminum and dipropylaluminum hydride and leave a silicon residue, heating said silicon residue in a furnace with calcium oxide, silicon dioxide and iron as needed to produce a ferrosilicon alloy of a desired ratio of silicon and iron and a quantity of slag, separating the ferrosilicon alloy from the slag and casting it into a desired shape; and



f. pyrolyzing the mixture of tripropylaluminum and dipropylaluminum hydride in an inert diluent to produce substantially pure aluminum powder, propylene and hydrogen, recovering the propylene and hydrogen and transferring them to the hydroaluminating step.

3,860,416
MODIFIED ALUMINUM PROCESS

Marcelian F. Gautreaux; John H. McCarthy; Walter E. Foster; Donald O. Hutchinson, and Frederick W. Frey, Jr., all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 277,383, Aug. 2, 1972,. This application Mar. 23, 1973, Ser. No. 344,213
Int. Cl. C22b *21/00;* **C22c** *21/02, 39/04*
U.S. Cl. 75—0.5 B **13 Claims**

1. A process for producing substantially pure aluminum from a raw diaspore clay, comprising, in sequence, the steps of:

a. comminuting the raw diaspore clay into particles about minus 100 mesh in size, beneficiating the ore particles to remove kaolin and quartz sand, and magnetically separating iron species to decrease the concentration of iron oxide in the clay to approximately 3 percent or less Fe_2O_3 to form a particulated diaspore mineral;
b. agglomerating the particulated diaspore mineral into ore compactions of a predetermined size and shape;
c. carbothermically reducing the ore compactions in an electric arc furnace to produce an aluminum-silicon alloy and effluent fume, and recycling said effluent fume to the agglomerating step;
d. comminuting the aluminum-silicon alloy to a particle size of about minus 100 mesh;
e. hydroaluminating the particulated aluminum-silicon alloy utilizing propylene, hydrogen and a sodium catalyst to form tripropylaluminum and dipropylaluminum hydride and leave a silicon residue, heating said silicon residue in a furnace with calcium oxide, silicon dioxide and iron as needed to produce a ferro-silicon alloy of a desired ratio of silicon and iron and a quantity of slag, separating the ferro-silicon alloy from the slag and casting it into a desired shape; and
f. pyrolyzing the mixture of tripropylaluminum and dipropylaluminum hydride in an inert hydrocarbon diluent to produce substantially pure aluminum powder, propylene and hydrogen, recovering the propylene and hydrogen and transferring them to the hydroaluminating step.

3,860,417

REDUCTION OF ORE IN A ROTARY DRUM

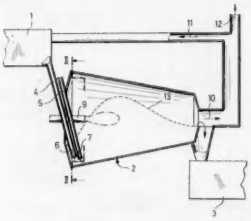
Horst Ritzmann, Neubeckum, Germany, assignor to Polysuis AG, Neubeckum, Germany

Filed Dec. 8, 1972, Ser. No. 313,597

Claims priority, application Germany, Jan. 14, 1972, 2201712

Int. Cl. C21b *13/08*

U.S. Cl. 75—36 **11 Claims**



1. A method for the reduction of ore comprising introducing ore and a reduction agent to one end of a rotary feeding drum at a rate between 15% and 45% of the volume of said drum; and rotating said drum at a speed between 0.15 and 0.8 its critical speed so that the contents of said drum turn and tumble as they are fed toward the opposite end of said drum, said agent being introduced to said drum at substantially the low point of turning of the contents of said drum whereby the agent introduced to said drum promptly is covered by the tumbling contents of said drum.

3,860,418

METHOD OF REFINING IRON MELTS CONTAINING CHROMIUM

Erik Anders Ake Josefsson; Folke Karl Evald Johansson; Kurt Karl Axel Almqvist, and Carl Fredrik Von Hoftsten, all of Borlange, Sweden, assignors to Stora Kopparbergs Bergslags Aktiebolag, Falun, Sweden

Filed June 14, 1972, Ser. No. 262,718

Claims priority, application Sweden, June 16, 1971, 7840/71

Int. Cl. C21c *5/32, 5/34*

U.S. Cl. 75—60 **7 Claims**

1. A method for refining carbon from an iron melt containing chromium comprising the steps of: maintaining said melt substantially free of surface slag, blowing oxygen gas from above onto said substantially slag free surface of said melt and subjecting said melt during carbon refining simultaneously to vigorous stirring by means of an inert gas being blown from under the surface of said melt as its surface is being kept substantially free of slag.

3,860,419

PROCESS FOR THE RECOVERY OF MOLYBDENUM FROM ROASTED MOLYBDENUM CONCENTRATES

Theodor Alexander Weber, Jerstedt, and Ralf Fritz Borrmann, Oker, both of Germany, assignors to Hermann C. Starck Berlin, Berlin, Germany

Filed Dec. 12, 1972, Ser. No. 314,472

Claims priority, application Germany, Dec. 14, 1971, 2162065

Int. Cl. C22b *3/00*

U.S. Cl. 75—103 **7 Claims**

1. A method of recovering roasted molybdenum concentrate containing molybdenum in the presence of impurities of the group which consists of copper, lead, zinc, bismuth, alkali metals and alkalne-earth metals; said method comprising the steps of:

a. digesting the roasted concentrate in an aqueous nitic acid solution containing ammonium nitrate at a temperature of 50°C to 100°C, said solution containing substantially 1.0 to 4.0 moles/liter of free nitric acid and 0.5 to 2.0 moles/liter of ammonium nitrate;

b. separating the digested concentrate from the nitric acid solution to yield a solid product; and

c. washing said solid product with hot water.

3,860,420

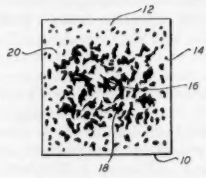
METHOD OF MAKING WELDING RODS BY SINTERING IN THE PRESENCE OF A LIQUID PHASE

Harbhajan S. Nayar, Plainfield, N.J., assignor to Air Reduction Company Incorporated, New York, N.Y.

Continuation of Ser. No. 99,870, Dec. 21, 1970, abandoned. This application June 18, 1973, Ser. No. 371,088

Int. Cl. B22f *3/10*

U.S. Cl. 75—208 R **13 Claims**



1. In the method of forming a metal article having an impermeable skin wherein metal particles of a known composition are placed in a mold cavity and heated in a protective atmosphere to a predetermined temperature sufficiently high to form some liquid metal, the improvement comprising heating the particle mass until sufficient liquid has formed on the surface thereof to form an impermeable skin upon cooling and ceasing the heating at a point when the particle mass has shrunk away from contact with the sides of the mold cavity and thereafter removing heat from the particle mass to cause it to solidify while a predetermined clearance exists between the particle mass and the mold cavity sides.

3,860,421

N-ALKYL MORPHOLINE TREATMENT OF A SELENIUM-CONTAINING PHOTOCONDUCTIVE LAYER

Bela Telek, and Thomas Skaper, both of Penfield, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 19, 1973, Ser. No. 408,248

Int. Cl. G03g *5/00, 5/02*

U.S. Cl. 96—1.5 **34 Claims**

25. An electrophotographic imaging member comprising a conductive substrate having operatively disposed in relation thereto a photoconductive imaging layer comprising amorphous selenium or selenium alloy, the surface of said imaging layer having deposited thereon a conditioning effective amount of at least one compound of the formula

wherein R is a saturated aliphatic hydrocarbon radical having from about 8 to about 30 carbon atoms.

3,860,422

PHOTOCONDUCTIVE ELEMENT WITH UNSAPONIFIED ALKYL VINYL ETHER-MALEIC ANHYDRIDE COPOLYMER INTERLAYER

Hiroshi Matsuno, Tokyo, and Ichiro Endo, Kawasaki, both of Japan, assignors to Cannon Kabishiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 230,129, Feb. 28, 1972, abandoned. This application Mar. 20, 1974, Ser. No. 453,181

Int. Cl. G03g *5/06*

U.S. Cl. 96—1.5 **6 Claims**

1. An electrophotographic photosensitive member comprising a support whose surface resistivity is less than 10^9 ohms, overlying the support an intermediate layer less than 10 microns thick for preventing electric deterioration and fatique phenomena due to repeated uses, said intermediate layer consisting essentially of an unsaponifed copolymer of an alkylvinylether and maleic anhydride, in which the number of carbon atoms in the alkyl radical of said alkylvinylether is 1–12 and a photoconductive layer, overlying said intermediate layer, said photoconductive layer consisting essentially of an organic photoconductive material.

3,860,423

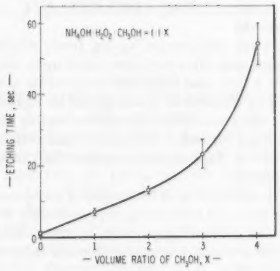
ETCHING SOLUTION FOR SILVER

Fumio Okamoto, Kamakura, Japan, assignor to RCA Corporation, New York, N.Y.

Filed Aug. 24, 1973, Ser. No. 391,358

Int. Cl. C23f *1/02*

U.S. Cl. 96—36.2 **4 Claims**



1. In a process for selectively etching thin silver films on a metal oxide substrate to form a pattern which comprises applying a photoresist layer over the silver film, exposing the photoresist to light through a photomask, developing the photoresist to expose a portion of the silver film and etching the exposed film away, the improvement which comprises employing as the etchant a mixture of from about 1.2 to about 4 mols of hydrogen peroxide and 4 mols of ammonia diluted with methanol so that the solution contains from about 50 to about 80 mol percent of methanol.

3,860,424

LED DISPLAY

Bertrand Harold Johnson, Murray Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 214,134, Dec. 30, 1971, abandoned. This application Oct. 18, 1973, Ser. No. 407,529

Int. Cl. G03c *5/00*

U.S. Cl. 96—38.4 **10 Claims**

1. A method for enhancing the contrast of an electroluminescent display device in which light-emitting devices are affixed to portions of a substrate and in which other portions of the substrate not covered with light-emitting devices are reflective and tend to reduce the contrast of the light-emitting regions with respect to the background of the display, the method characterized by photolithographically applying selectively to the light-reflecting portions a photoresist, and baking the photoresist at a temperature sufficient to darken the photoresist significantly and cause it to adhere permanently to those portions so as to remain a part of the finished device.

3,860,425

DISPERSION CONTAINING NONIONIC SURFACE ACTING AGENT WITH UNITS OF POLYOXYETHYLENE AND POLYOXYPROPYLENE

Yoshiaki Ono; Masakazu Yoneyama; Hirozo Ueda, and Nobuo Yamamoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 23, 1972, Ser. No. 283,026

Claims priority, application Japan, Aug. 25, 1971, 46-64991

Int. Cl. G03c *1/92*

U.S. Cl. 96—82 **15 Claims**

1. A multilayer photographic light-sensitive silver halide element containing a dispersion comprising an aqueous gelatin solution having dispersed therein at least one oleophilic material selected from the group consisting of an oleophilic dye for a silver dye bleaching process, an oleophilic coupler free of a water solubilizing group, an oleophilic ultraviolet absorbent, an oleophilic antioxidant, an oleophilic dye image stabilizing agent and an oleophilic fluorescent brightening agent, in the presence of (a) a nonionic surface active agent containing polyoxypropylene units having a molecular weight of greater than 500 and polyoxyethylene units and a molar ratio of said polyoxyethylene units to said polyoxypropylene units ranging from 0.5 to 0.6, and (b) an anionic surface active agent having an $-OSO_3M$ group or an $-SO_3M$ group, wherein M represents a monovalent cation, and a hydrophobic group, said nonionic surface active agent being a slightly water-soluble polyoxyethylene/polyoxypropylene block polymer wherein the entire polyoxypropylene portion thereof has a molecular weight greater than 500 and wherein the molar ratio of all of the polyoxyethylene units thereof to all of the polyoxypropylene units thereof ranges from 0.1 to 0.6.

3,860,426

SUBBED LITHOGRAPHIC PRINTING PLATE

Michael P. Cunningham, and David J. McClune, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 22, 1972, Ser. No. 317,583

Int. Cl. G03c *1/94*

U.S. Cl. 96—86 P **11 Claims**

1. In a lithographic printing plate having an anodized aluminum support, a hydrophilic cellulosic subbing layer and a selectively removable polymeric printing layer prepared from a radiation-sensitive polymer containing the grouping:

$$\underline{-CH=CH-\overset{O}{\overset{\|}{C}}-}\ ,$$

the improvement in which a water soluble salt of a metal selected from the class consisting of zinc, calcium, magnesium, barium, strontium, cobalt and manganese is incorporated in said cellulosic subbing layer in an amount sufficient to reduce scumming of said plate in areas in which said printing layer is removed.

3,860,427
QUICK-PROCESSABLE LIGHT-SENSITIVE COLOR PHOTOGRAPHIC MATERIAL

Shunji Matsuo; Shui Sato, both of Tokyo; Hidehiko Ishikawa, Odawara; Shinichi Nakamura, Odawara, and Masahiko Taguchi, Odawara, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Chuo-ku, Tokyo, Japan

Filed Dec. 27, 1972, Ser. No. 318,857

Claims priority, application Japan, Dec. 28, 1971, 46-002165

Int. Cl. G03c *1/78*

U.S. Cl. 96—87 R **1 Claim**

1. A light-sensitive silver halide color photographic material suitable for quick processing, which comprises a support and, coated on said support, a coupler-containing photographic gelatin emulsion layer having a coupler-to-gelatin ratio in parts by weight of from about 1:3 to 1:5, said support having a polyethylene film base which has been subjected to a corona discharge treatment.

3,860,428
SILVER HALIDE PEPTIZERS CONTAINING BIS(THIOETHER) LINKAGES

Ignazio S. Ponticello; Ernest J. Perry, and Richard C. Tuites, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

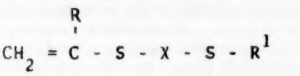
Filed Dec. 20, 1973, Ser. No. 426,839

Int. Cl. G03c *1/04*

U.S. Cl. 96—114 **20 Claims**

1. A photographic silver halide emulsion containing a peptizer comprising an addition interpolymer comprising

A. from about 1 to about 20 mole percent of a polymerized monomer having the formula



wherein

R is hydrogen or methyl,

R^1 is alkyl, cycloalkyl, aryl or substituted aryl and

X is alkylene or an alkylene having a cycloalkylene or an arylene group interposed in the backbone of the alkylene chain; and

B. from about 80 to about 99 mole percent of at least one additional polymerized ethylenically unsaturated monomer.

3,860,429
PHOTOPOLYMERIZATION OF ETHYLENICALLY UNSATURATED ORGANIC COMPOUNDS

Robert T. Lu, Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.

Filed Mar. 16, 1973, Ser. No. 341,854

Int. Cl. G03c *1/68*

U.S. Cl. 96—115 P **16 Claims**

1. A photosensitizing composition selected from the group consisting of a blend of $Fe_3(CO)_{12}$ and a co-catalyst selected from the group consisting of alpha-bromoisobutyrophenone, cumene, carbon tetrachloride, diisopropyl benzene, alkyl mercaptans containing from 10 to 16 carbon atoms, thiourea, organic peroxides, and mixtures thereof and a blend of $Fe_3(CO)_{12}$, organic peroxide, alphabromoacetophenone, wherein the weight ratio of co-catalyst or alpha-bromoacetophenone to iron dodecacarbonyl is from 0.2 to 10.

3,860,430
FILMING AMINE EMULSIONS

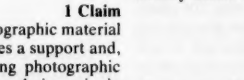
Jerry Lee Walker, and Thomas Edward Cornelius, III, both of Coraopolis, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Nov. 5, 1973, Ser. No. 413,079

Int. Cl. C09k *11/14; C09d 5/08*

U.S. Cl. 106—14 **37 Claims**

1. A corrosion-inhibiting composition comprising an aliphatic film-forming amine; and a polyoxyalkylene-containing tertiary amine dispersing agent represented by the formula:



wherein R_1 and R_2 are aliphatic hydrocarbon radicals having from 12 to 20 carbon atoms, which can be the same or different; and wherein R_3O is a polyoxyalkylene chain of randomly distributed oxyethylene and oxypropylene units in a ratio of from 1:10 to 10:1, respectively, the total of all units in the chain being n, which is an integer of 3 to 100.

3,860,431
SLIP RESISTANT COMPOSITION FOR PAPER COATING

Charles C. Payne, Chicago, and Peter H. Vossos, Lisle, both of Ill., assignors to Nalco Chemical Company, Chicago, Ill.

Filed Apr. 28, 1972, Ser. No. 248,462

Int. Cl. B01j *13/00;* **C09k** *3/14*

U.S. Cl. 106—36 **10 Claims**

1. A silica sol concentrate having finely divided, discrete silica particles, said silica particles which upon dilution aggregate to form a floc; said silica sol concentrate comprising:

A. from 2 to 20 percent by weight of an aqueous colloidal anionic silica sol containing approximately 50 percent by weight silica, the silica particles in said colloidal silica sol having an average diameter within the range of 4 to 40 millimicrons;

B. from 70 to 88 percent by weight of an aqueous colloidal anionic silica sol containing approximately 50 percent by weight silica, the silica particles in said colloidal silica sol having an average diameter within the range of 60 to 120 millimicrons;

C. from 0.25 to 3.0 percent by weight of a water-dispersible, polymeric flocculating agent which is a compound from the group consisting of polyethylene glycol with a molecular weight of between 200 to 600 diesterified with fatty acids containing 14 to 18 carbon atoms, and mixtures thereof;

D. from 6 to 10 percent by weight of a polyhydric alcohol having a molecular weight within the range of 50 to 1,000; and

E. from 0 to 0.5 percent of a biocide.

3,860,432
PORCELAIN ELECTRIC INSULATOR

Noboru Higuchi; Yutaka Ogawa, and Soji Takeuchi, all of Nagoya City, Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Continuation-in-part of Ser. No. 55,111, July 15, 1970, abandoned. This application Nov. 2, 1972, Ser. No. 303,279

Int. Cl. C04b *33/26, 33/24, 35/00*

U.S. Cl. 106—46 **18 Claims**

1. A porcelain consisting of 10 to 35 percent by weight of corundum, 25 to 40 percent by weight of cristobalite, 15 to 30 percent by weight of mullite, 2 to 8 percent by weight of quartz and the remainder of glassy phase.

3,860,433

VERY HIGH EARLY STRENGTH CEMENT

Borje W. A. Ost, Rt. 1 Box 357, Lake Zurich, Ill. 60047; Benedict Schiefelbein, 420 Woodbine, Fox River Grove, Ill. 60021, and John M. Summerfield, 426 W. Russell Street, Barrington, Ill. 60010

Filed May 30, 1972, Ser. No. 257,629
Int. Cl. C04b 7/04
U.S. Cl. 106—89 22 Claims

1. A fast-setting hydraulic cement which rapidly develops strength and which has a compressive strength of at least about 2,900 pounds per square inch within 24 hours after initiation of hydration, containing from about 20 percent to about 40 percent by weight of C_3A_3CS and from about 10 percent to about 35 percent by weight of chemically unbound $CaSO_4$, and the remainder being substantially beta C_2S.

3,860,434

ALLOYED STEEL TREATMENT WITH PROTEIN CONTAINING COMPOSITION

Masanaga Okabe, Ikeda; Hiroshi Nakamura, Tondabayashi; Sumio Sakata, Kobe; Iwawo Kawasaki, Takaishi, and Yasuo Morikawa, Sakai, all of Japan, assignors to Oxy Metal Finishing Corporation, Warren, Mich.

Filed Aug. 21, 1973, Ser. No. 390,261
Claims priority, application Japan, Aug. 26, 1972, 47-84986
Int. Cl. C08h 17/24, 17/00; C23r 7/18
U.S. Cl. 106—135 8 Claims

1. An aqueous composition suitable for treating an alloyed steel surface prior to cold forming comprising from 5 to 100 g/l oxalate, at least 0.1 g/l of a protein, and from 0.1 to 20 g/l of an oxidizing agent selected from the nitrates, nitrites and chlorates.

3,860,435

SYNTHETIC MINERAL SAND PRODUCED FROM STAUROLITE

Thomas Edward Garnar, Jr., Swan Lake, Fla., assignor to E. I. du pont de Nemours and Company, Wilmington, Del.

Filed Oct. 17, 1972, Ser. No. 298,303
Int. Cl. C08h 17/04; C09c 1/40
U.S. Cl. 106—288 B 4 Claims

1. A synthetic free flowing sand suitable for use in the manufacture of foundry molds and characterized by minimal and irreversible thermal expansion at temperatures up to 2675°F., said sand being the product resulting from calcination of a predominantly staurolite mineral concentrate in a fluid bed reactor at a temperature of 2100°F. to 2300°F. for a sufficient time to convert essentially all of the alumina content of said staurolite to mullite.

3,860,436

CONSTANT CURRENT BIASING TRANSFER SYSTEM

Thomas Meagher, 41 Anytrell Dr., Webster, N.Y. 14580

Division of Ser. No. 309,562, Nov. 24, 1972, Pat. No. 3,781,105. This application June 11, 1973, Ser. No. 368,570
Int. Cl. G03g 13/16, 15/16
U.S. Cl. 117—17.5 2 Claims

1. A transfer method for transferring an image of electrically charged particles from an original support to a transfer member with an electrically relaxable transfer electrode comprising:

rotating said transfer electrode,

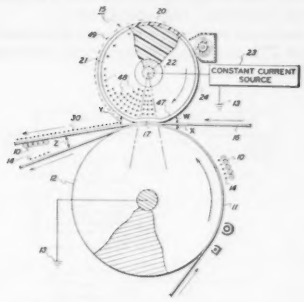
establishing a nip between said transfer electrode and said origina! support,

passing said transfer member through said nip from a pre-nip side of said nip through a post-nip side of said nip,

applying an electrical bias to said transfer electrode,

forming with said electrical bias and said transfer electrode electrical fields which are asymmetrical between said pre-nip and post-nip sides of said nip and which have post-nip electrical fields substantially above air ionization levels and pre-nip electrical fields below substantial air ionization levels,

and automatically varying said electrical bias applied to said transfer electrode to maintain said pre-nip and post-nip



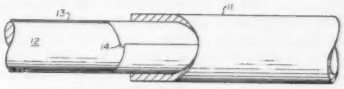
electrical field levels under variable transfer conditions including variations in the resistivity of said transfer electrode by steps including maintaining said applied electrical bias at a substantially constant pre-set applied current level.

3,860,437

METHOD FOR PRODUCING REFRACTORY CARBIDE COATINGS ON GRAPHITE

William H. Gust, Lafayette, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Mar. 10, 1959, Ser. No. 798,553
Int. Cl. B44l 5/12
U.S. Cl. 117—46 CC 12 Claims



1. The process for coating graphite with an adherent, continuous layer of metallic carbide comprising the steps of disposing a quantity of a refractory, carbide forming metal to be carburized in contiguous, generally spaced relation with a smooth graphite surface, said spacing being sufficient to permit flow of a gas between said surface and said metal, enclosing said assembly with a nonreacting gaseous atmosphere containing methane, heating said assembly to a temperature above the decomposition point of said methane and slightly above the softening point of said metal, whereby a quantity of said methane undergoes pyrolysis and deposits carbon on said graphite and said metallic surfaces, and quickly raising the temperature of said assembly to a point at which carburization occurs.

3,860,438

FLUX AND METHOD OF COATING FERROUS ARTICLE

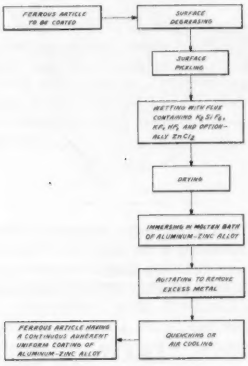
Carlyle E. Shoemaker, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Mar. 11, 1974, Ser. No. 449,805
Int. Cl. C23c 1/08; C23f 17/00
U.S. Cl. 117—50 14 Claims

1. A method of forming a continuous alloy coating consisting of from 25% to about 70%, by weight aluminum, balance essentially zinc, on a ferrous article, comprising the steps of cleaning said ferrous article to remove grease and oxides from the surfaces thereof to be coated, immersing said article in an

aqueous flux consisting essentially of potassium fluosilicate, potassium fluoride, zinc chloride, and an acid selected from the group consisting of hydrofluoric acid and a mixture of hydrofluoric acid and hydrochloric acid, removing said article from the aqueous flux, drying said article by heating to a low temperature, and immersing the article in a molten bath containing said aluminum - zinc coating alloy.

13. A method of forming a continuous alloy coating consisting of from 25% to about 70%, by weight aluminum, balance


FERROUS ARTICLE TO BE COATED
SURFACE DEGREASING
SURFACE PICKLING
WETTING WITH FLUX CONTAINING K_2SiF_6, KF, HF, AND OPTIONALLY $ZnCl_2$
DRYING
IMMERSING IN MOLTEN BATH OF ALUMINUM-ZINC ALLOY
AGITATION TO REMOVE EXCESS METAL
QUENCHING OR AIR COOLING
FERROUS ARTICLE HAVING A CONTINUOUS ADHERENT UNIFORM COATING OF ALUMINUM-ZINC ALLOY

essentially zinc, on a ferrous aritcle, comprising the steps of cleaning said ferrous article to remove grease and oxides from the surfaces thereof to be coated, immersing said article in an aqueous flux consisting essentially of potassium fluosilicate, potassium fluoride and an acid selected from the group consisting of hydrofluoric acid and a mixture of hydrofluoric acid and hydrochloric acid removing said article from the aqueous flux, drying said article by heating to a low temperature, and immersing the article in a molten bath containing said aluminum-zinc coating alloy.

3,860,439
FLAME RETARDANT PROCESS FOR CELLULOSICS

George M. Wagner, Lewiston, N.Y., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 244,574, April 17, 1972,. This application Aug. 6, 1973, Ser. No. 385,782
Int. Cl. B44d *1/44*
U.S. Cl. 117—62.2 **9 Claims**

1. A process for imparting flame retardant character to cellulose containing material which comprises

1. impregnating a cellulose-containing material with an aqueous solution having a pH of from about 7 to about 9 and containing from about 10 to about 40 percent by weight of tetrakis(hydroxymethyl) phosphonium hydroxide compound;
2. drying the thus impregnated material to about 0 to about 8 percent moisture retention;
3. aerating the dried impregnated material by passing air through said material;
4. exposing said aerated material to an atmosphere containing at least about 50 percent by volume of gaseous ammonia in an enclosed chamber for a period of from about 5 to less than about 45 seconds to polymerize the phosphonium compound in and on the cellulose containing material, and
5. contacting the material exiting from said enclosed chamber with water in an amount sufficient to provide a pick-up of water by the material of from about 10 to about 40 percent by weight.

3,860,440
METHOD OF MANUFACTURING A HIGHLY GLOSSY SHEET MATERIAL

Shogo Nakajo, Nishinomiya City, Japan, assignor to Kurashiki Rayon Co., Ltd., Sakazu, Kurashiki, Japan

Continuation of Ser. No. 737,852, June 18, 1968, abandoned. This application Mar. 26, 1973, Ser. No. 344,924
Claims priority, application Japan, June 30, 1967, 42-42707
Int. Cl. B32b *5/18;* **B44d** *1/14*
U.S. Cl. 117—64 R **12 Claims**

1. A method of manufacturing highly glossy sheet material which comprises:

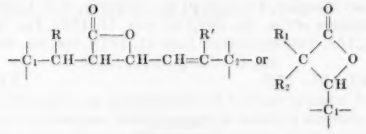
a. applying a layer of polymer solution comprising a polyurethane elastomer and a solvent therefor to a highly smooth-surfaced body kept at a temperature of about 40°–85°C, to evaporate the solvent from the polymer solution,
b. superimposing a substrate which has a substantially smooth surface and is permeable to gas and vapor onto the layer of said polymer solution before said layer is coagulated,
c. substantially coagulating said layer of said polymer solution sandwiched between said body and said substrate by removing the solvent from the layer of said polymer solution through the substrate, and
d. peeling off said substrate to which the coagulated polymer is adhered from said body.

3,860,441
PROCESS AND COMPOSITION FOR WATER PROOFING SUBSTRATES

Walter L. Vaughn; Sherman Kottle, and Richard H. Symm, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 218,009, Jan. 14, 1972, , which is a continuation-in-part of Ser. No. 9,975, Feb. 9, 1970, abandoned. This application Apr. 12, 1974, Ser. No. 460,326
Int. Cl. B44d *1/44*
U.S. Cl. 117—65.2 **7 Claims**

1. A process for improving the dimensional stability or water repellency of reactive or polar substrates which comprises treating the substrate with from 5 to 100 weight % wet pick-up of treating composition, and curing the treated substrate at from about 80°C to about 170°C for about 0.1 minute to about 3 hours wherein the said treating composition comprises an inert anhydrous solvent containing from about 0.05 to about 20 weight percent of one or more reactive polyalkylene copolymers of the formulas



wherein C_1 and C_2 are, independently, carbon atoms in the polyalkylene chain, said chain being a polymeric series of alkylene groups; R and R′ are, independently, hydrogen, an alkyl group of up to about 20 carbon atoms, phenyl, —COOH, or a segment of the polyalkylene chain; and R_1 and R_2 are, independently, alkyl, aryl, aralkyl or alkaryl groups of up to about 20 carbon atoms, said polyalkylene copolymer having a molecular weight of from about 800 to those of high polymers.

3,860,442

PROCESS FOR BONDING ETHYLENE COPOLYMERS TO FIBERS

Giulio Natta; Febo Severini, both of Milan; Augusto Portolani, Ferrara, and Carlo Tavazzani, Milan, all of Italy, assignors to Montecantini Edison S.p.A., Milan, Italy

Continuation of Ser. No. 876,184, Nov. 28, 1969, abandoned. This application Apr. 18, 1972, Ser. No. 245,289

Int. Cl. D06m *15/28, 15/46*

U.S. Cl. 117—76 T 17 Claims

1. In a process for bonding (1) a saturated copolymer of ethylene with an alpha-olefin or (2) a terpolymer of ethylene with an alpha-olefin and a cyclic or acyclic diene having non-conjugated double bonds, said terpolymer having a low degree of unsaturation, to natural or synthetic fibers, said process comprising impregnating said fibers with an aqueous dispersion of phenol-formaldehyde resin and an aqueous elastomeric latex containing one or more surface-active agents, the pH of said dispersion of latex and phenol-formaldehyde resin having been matured for a time of from about 10 to 80 hours, so as to effect a solids content in the treated fibers, on a dry basis, of about 5% by weight, drying the thus treated fibers, assembling said fibers with an elastomeric mixture consisting essentially of the above defined copolymer or terpolymer and of a vulcanizing agent, and vulcanizing by heating at a temperature of from about 110° to 220°C, the improvement comprising employing as the elastomeric component of said latex a saturated elastomeric ethylene-alpha-olefin copolymer or a low-unsaturation elastomeric terpolymer of ethylene/alpha-olefin/cyclic or acyclic diene having non-conjugated double bonds that is grafted with an acid water-soluble vinyl or vinylidene monomer selected from the group consisting of acrylic acid, methacrylic acid, mixtures thereof, mixtures of one of said acids with a lower alkylester thereof, lower alkylesters of acrylic acid, lower alkylesters of methacrylic acid, sorbic acid, muconic acid, crotonic acid and lower alkylesters thereof.

3,860,443

GRAPHITE COMPOSITE

Walter L. Lachman, Concord, Mass.; Robert A. Penty, Kennebunk, Maine, and Apul F. Jahn, Chelmsford, Mass., assignors to Fiber Materials, Inc., Graniteville, Mass.

Filed Mar. 22, 1973, Ser. No. 343,650

Int. Cl. C23c *11/00*

U.S. Cl. 117—106 10 Claims

1. Method of forming a fiber-metal composite, comprising the steps of:

forming a coating of material selected from the group consisting of titanium boride, and a mixture of titanium boride and titanium carbide on a plurality of carbon fibers;

immersing the coated fibers into a body of molten metal selected from the group consisting of magnesium, lead, zinc, copper, aluminum, tin and alloys of said metals until said metal substantially fills the interstices between said fibers; and

cooling the metal body with said coated fibers embedded therein to a temperature at which said metal solidifies.

3,860,444

COATING OF WORKPIECES BY VAPOR DEPOSITION

Georges Henri Donckel, Dudelange, Luxembourg, and Dominique Thomas Francois Leon Joseph Marie Streel, Cointe-Sclessin, Belgium, assignors to Cockerill-Ougree-Providence S.A., Seraing, Belgium and Acieries Reunies De Burbach-Eich-Dudelange S.A., Luxembourg, Luxembourg

Filed Feb. 6, 1973, Ser. No. 330,126

Claims priority, application Luxembourg, Feb. 8, 1972, 64748

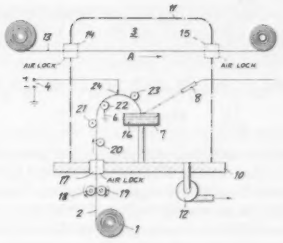
Int. Cl. C23c *13/02*

U.S. Cl. 117—107 5 Claims

1. A method of coating workpieces by vapor deposition, comprising the steps of:

disposing a workpiece in an evacuated enclosure;

heating a bath of molten metallic composition with a melting point above 1,200°C by a first heat source in said enclosure to an elevated temperature sufficient to vaporize part of said composition for deposition on the workpiece;



introducing an elongate solid element of said composition into said enclosure, with progressive immersion of a free end of the element into the bath through an exposed surface thereof to replenish vapor losses; and

preheating said element by a second heat source independent of said first heat source within said enclosure, at a location spaced from its point of immersion, to a level not more than 1,000°C lower than said elevated temperature.

3,860,445

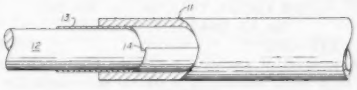
METHOD FOR PRODUCING REFRACTORY CARBIDE COATINGS ON GRAPHITE

William H. Gust, Lafayette; Richard A. Heckman, Livermore, and Wallace E. Voreck, Jr., Alamo, all of Calif., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Mar. 10, 1959, Ser. No. 798,555

Int. Cl. B44d *5/12*

U.S. Cl. 117—118 15 Claims



1. A process for coating graphite with an adherent, continuous layer of metallic carbide comprising the steps of disposing a quantity of metal selected from the group consisting of molybdenum, niobium and zirconium in contiguous gas permeable relation with a first piece of graphite, superimposing a graphite clamping means of identical surface shape over said metal and said graphite piece, adjusting said graphite clamping means and said graphite piece to maintain a tolerance of about 1 mil between said metal and at least one contiguous graphite surface degassing said assembly, enclosing said graphite-metal interfaces within a nonreactive gaseous atmosphere, quickly heating said assembly to a temperature at which said metal carburizes, cooling said assembly and mechanically separating and removing said graphite clamping means from said adherent coating.

3,860,446

TREATMENT OF KERATINOUS FIBRES AND FABRICS

Michael Rushforth, Raistrick, and Kenneth Winterbottom, Whittlesford, both of England, assignors to Ciba-Geigy AG, Basle, Switzerland and I.W.S. Nominee Company Limited, London, England

Continuation of Ser. No. 78,286, Oct. 5, 1970, abandoned. This application Mar. 5, 1973, Ser. No. 338,004

Claims priority, application Great Britain, Oct. 8, 1969, 49542/69

Int. Cl. D06m *3/06, 13/28*

U.S. Cl. 117—141 8 Claims

1. A process for rendering woolen fabrics shrink-resistant which comprises applying to said fabric 0.5 to 15% by weight of a polysulfide of the formula

$$HS[RO_m(CHO)_nR_pSS]_qRO_m(CHO)_nR_pSH$$
$$\quad\quad R^1 \quad\quad\quad\quad R^1$$

where R denotes an alkylene hydrocarbon group containing from 2 to 4 carbon atoms, R^1 denotes a radical selected from the group consisting of hydrogen, methyl and ethyl, q is an integer which has an average value of at least 1, and is such that the polysulfide has an average molecular weight of at least 500 and at most 8000, and m, n and p are selected from the group consisting of zero and 1, with the proviso that m and p have identical values and when m represents zero, n also represents zero, and curing the polysulfide on the fabric.

3,860,447

METHOD OF RENDERING A HYDROPHILIC SURFACE HYDROPHOBIC

Wesley Peter Townsend, East Windsor, Mercer County, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Jan. 2, 1973, Ser. No. 320,228

Int. Cl. C03c *17/10*

U.S. Cl. 117—169 R 3 Claims

1. In a method of rendering a hydrophilic surface hydrophobic, which comprises exposing the surface to an aqueous, inorganic solution comprising a La^{+3} salt dissolved therein, said solution having a pH ranging from 3.5 to 8.0.

3,860,448

METHOD OF APPLYING SILICONE PASSIVANTS TO ETCH MOATS IN MESA DEVICE WAFERS

Mark L. Konantz, and Ronald K. Leisure, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 25, 1973, Ser. No. 354,220

Int. Cl. B44d *1/18*; B44c *1/02*

U.S. Cl. 117—212 3 Claims

2. A method of applying a silicone elastomer passivant lining to a major surface of a silicon semiconductor wafer having a plurality of discrete devices included therein in which each of said devices has an emitter mesa upstanding on said major surface, said method comprising the steps of:

coating said major surface with a masking layer that defines a plurality of annular areas circumscribing each mesa emitter;

etching said areas in said wafer major surface to produce etch moats that extend down through a collector-base PN junction;

applying a liquid blanket coating of uncured silicone elastomer passivant to said etch moats and said masking layer wherein the silicone elastomer passivant will adhesively bond to said etch moats upon partial cure;

placing on said silicone elastomer passivant blanket coating a layer of fabric to which said silicone elastomer passivant will adhesively bond upon partial curing, wherein said fabric layer completely overlies said wafer;

heating to partially cure the entirety of said silicone elastomer passivant blanket coating to produce cohesive strength in said coating but so that the coating has a greater adherence to said etch moats and said fabric layer than cohesive strength;

pulling said fabric layer and an adherent blanket layer of partially cured silicone elastomer passivant away from said wafer surface to remove said partially cured coating as a continuous blanket, while leaving portions of said blanket interfacing with said wafer surface as a continuous coating of partially cured silicone elastomer passivant completely lining each of said etch moats; and

thereafter, heating to completely cure said lining of partially cured silicone elastomer passivant left within said etch moats.

3,860,449

LOW FRICTION MAGNETIC RECORDING MEDIUM

Goro Akashi; Masaaki Fujiyama, and Akira Kasuga, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 874,378, Nov. 5, 1969, abandoned. This application May 8, 1972, Ser. No. 250,992

Claims priority, application Japan, Nov. 6, 1968, 43-81069

Int. Cl. H01f *10/00*

U.S. Cl. 117—235 5 Claims

1. A magnetic recording medium having increased wear-resistance and friction characteristics comprising a support, a magnetic recording layer provided on one side of said support and a lubricating layer provided on the opposite side of said support from said magnetic recording layer, said lubricating layer consisting essentially of from 60 to 95% by weight, based on the weight of the lubricating layer, of tungsten disulfide particles having an average particle size of less than 10 microns and finely divided particles of a material having a Mohs' hardness of higher than 5 dispersed in a synthetic resin binder.

3,860,450

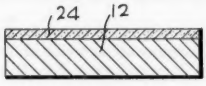
METHOD OF FORMING MAGNETITE THIN FILM

Marc-Aurele Nicolet, Pasadena, Calif.; Christopher H. Bajorek, Katonah, N.Y., and Joseph Shao-Ying Feng, Kenilworth, Ill., assignors to California Institute of Technology, Pasadena, Calif.

Filed May 5, 1972, Ser. No. 250,565

Int. Cl. H01f *10/00*

U.S. Cl. 117—237 10 Claims



1. A method of forming a magnetite film comprising the steps of:

depositing a thin film of pure iron on a substrate;

annealing at least the upper portion of the deposited iron film to form a hematite film, by exposing the deposited iron film to oxygen at a temperature below about 560°C;

depositing a layer of pure iron on the hematite film; and

annealing the composite iron coated hematite film in an inert environment at a temperature below about 560°C at a pressure not less than about 10^{-7} Torr, thereby converting the composite film to a magnetite film.

3,860,451

METHOD FOR PREPARING A MAGNETIC SUBSTRATE

Charles M. Starks, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Jan. 2, 1973, Ser. No. 320,427
Int. Cl. H01f *10/00*
U.S. Cl. 117—240 1 Claim

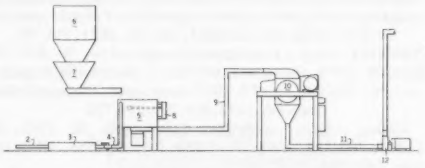
1. In a method for preparing a flexible substrate having magnetically sensitive particles on the surface thereof by impregnating the surface with a salt or oxide of iron and thereafter reducing said salt or oxide in situ to magnetic iron, the improvement which comprises carrying out the reduction of said salt or oxide with aluminum triethyl, diethyl aluminum hydride or mixture thereof.

3,860,452

METHOD OF DISSOLVING GRANULATED MATERIAL

George W. Paugh, Saint Louis, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 222,749, Feb. 2, 1972, abandoned. This application Aug. 1, 1973, Ser. No. 384,669
Claims priority, application Canada, Dec. 6, 1972, 158206
Int. Cl. B01f *1/00*; C13f *1/14*
U.S. Cl. 127—63 20 Claims



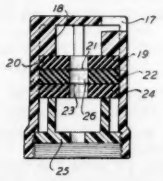
1. A method for continuously forming a liquid product from a dissolvable granular material and a liquid comprising the steps of: forming a mixture of the granulated material and water in a predetermined ratio, agitating the mixture to get a substantially uniform suspension of the granular material in the liquid, advancing successive portions of the substantially uniform suspension to a grinder and continuously grinding the suspension sufficiently to substantially instantly dissolve the granular material to form the liquid product.

3,860,453

NON-SPILL VENT VALVE FOR LIQUID ELECTROLYTE BATTERY

Jacob E. Schmidt, Great Notch Twp., Little Falls, Passaic County, N.J., assignor to McGraw-Edison Company, Elgin, Ill.

Filed Oct. 30, 1972, Ser. No. 301,871
Int. Cl. H01 *1/06*
U.S. Cl. 136—177 2 Claims



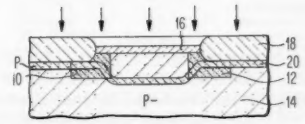
1. A non-spill vent valve for a liquid electrolyte battery comprising a container having a passageway therethrough for venting of gases from the battery to the outside atmosphere, means for securing said container liquid tight onto the cover of a battery case in registration with an opening therein, and a plurality of spaced microporous diaphragms in said vent passageway secured hermetically around the outer rims thereof to the inside wall of said container to provide a gas space in said passageway accessible only by diffusion of gases through said diaphragms with one diaphragm exposed to the atmosphere of the battery and the other diaphragm exposed to the outside atmosphere, wherein said vent valve comprises a unitary capsule in said vent passageway including a metal cylindrical cup of a material inert to said electrolyte said cup having a central opening in its inner end wall, and said cup having a stack of rubber washers and of intervening circular microporous diaphragms between adjacent pairs of said washers fitted into said cup, and a metal washer in the outer end of said cup with the edge of said cup crimped over onto said metal washer to exert clamping pressure against said stack.

3,860,454

FIELD EFFECT TRANSISTOR STRUCTURE FOR MINIMIZING PARASITIC INVERSION AND PROCESS FOR FABRICATING

David De Witt, Poughkeepsie, and William S. Johnson, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 27, 1973, Ser. No. 374,152
Int. Cl. H01l *7/54*
U.S. Cl. 148—1.5 7 Claims



1. A process for fabricating a field effect transistor having minimal parasitic inversion comprising

forming a field layer of insulating material on the surface of a monocrystalline semiconductor body embodying a first type impurity for semiconductors and having spaced regions of a second opposite type impurity,

forming an opening in said field layer, exposing at least the gate region of the ultimate field effect transistor,

forming a gate insulating layer of material in said opening of a thickness significantly less than the thickness of said field layer,

bombarding the surface of said body with impurity ions of a first type at an energy sufficient to penetrate said field insulation layer to produce an increased concentration of impurity ions just beneath the semiconductor body, field insulation layer interface, and a buried layer of impurity in the gate region, and

forming electrical contacts on the resultant device.

3,860,455

METHOD FOR PHOSPHATIZING FERROUS SURFACES

Hans Hansen, Karben; Dieter Hauffe; Karl-Heinz Hehn, both of Frankfurt am Main; Karl-Heinz Nuss, Neu Isenburg; Werner Rausch, Stierstadt; Josef Rothkegel, Wachenbuchen, and Peter Wimmers, Frankfurt an Main-Niederrad, all of Germany, assignors to Oxy Metal Finishing Corporation, Warren, Mich.

Filed Mar. 16, 1973, Ser. No. 341,831
Int. Cl. C23f *7/10*
U.S. Cl. 148—6.15 R 5 Claims

1. In a method of phosphation of steel with an aqueous acidic manganese phosphate treating solution wherein the weight ratio of free P_2O_5 to total P_2O_5 in said treating solution is between 0.05 and **0.45:1**, the improvement comprising replenishing said treating solution with an aqueous makeup solution comprising manganese and P_2O_5 in a weight ratio between 0.05 and **0.6:1** and wherein the weight ratio of free

to total P_2O_5 is between 0.5 and 1.0:1, inclusive of any neutralizing agent added.

3,860,456

HOT-ROLLED HIGH-STRENGTH LOW-ALLOY STEEL AND PROCESS FOR PRODUCING SAME

Paul E. Repas, Monroeville, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed May 31, 1973, Ser. No. 365,777

Int. Cl. C21d *7/14, 9/08*

U.S. Cl. 148—12 F **16 Claims**

1. A process for producing a hot-rolled high-strength low-alloy steel having a yield strength of at least 65 ksi and exceptional toughness at subzero temperatures characterized by 50% shear FATT values at temperatures as low as −80°F, the steps comprising:

a. forming a steel slab having the following composition by weight:

carbon	0.03 to 0.15%
phosphorus	0.04 % max.
sulfur	0.04 % max.
manganese	0.5 to 2.0 %
molybdenum	0.1 to 0.40%
columbium	0.01 to 0.10%
vanadium	0 to 0.20%
iron and impurities	balance;

b. heating said slab to a temperature sufficiently above the Ar_3 transition temperature to austenitize the microstructure and dissolve all carbide and nitride precipitates into the austenitic microstructure;

c. hot rolling said heated slab at a temperature above the Ar_3 transition temperature sufficient to effect no more than 90% of the intended hot reduction;

d. cooling the partially hot-rolled slab to a temperature below the Ar_3 transition temperature but above the Ar_1 transition temperature to cause a portion of the austenitic microstructure to transform to ferrite;

e. further hot rolling said partially hot rolled slab at a temperature between the Ar_3 and Ar_1 transition temperature sufficient to effect a thickness reduction of from 10 to 40%; and

f. thereafter cooling the hot rolled steel to ambient temperatures whereat said steel is characterized by the presence of both equiaxed and cold-worked ferrite grains with a uniform distribution of carbide and nitride precipitates throughout.

3,860,457

A DUCTILE IRON AND METHOD OF MAKING IT

Jouko Vourinen; Yrjo Ingman; Matti Johansson, all of Karkkila, and Martti Kurkinen, Tapiola, all of Finland, assignors to Kymin Osakeyhtio-Kymmene Aktiebolag, Kuusankoski, Finland

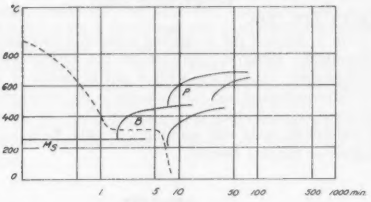
Filed July 6, 1973, Ser. No. 377,035

Claims priority, application Finland, July 12, 1972, 1996/72; July 12, 1972, 1997/72

Int. Cl. C21d *1/46, 5/00;* **C22c** *37/04*

U.S. Cl. 148—15 **7 Claims**

1. A ductile iron especially applicable to machine elements exposed to fatigue stresses, containing as alloying elements molybdenium 0.10–0.26 per cent by weight and manganese 0.3–1.4 per cent by weight and having a microstructure of isothermal bainite and 20 to 50% by volume of retained austenite enabling work hardening of the ductile iron in use when exposed to said fatigue stresses or by machining.



3,860,458

METHOD OF MAKING A MAGNETIC BODY

Kiyoshi Inoue, and Hideo Kaneko, both of Tokyo, Japan, assignors to Ishijuku Kinzoki Kogyo K.K., Tokyo, Japan

Division of Ser. No. 138,081, April 4, 1971, Pat. No. 3,689,254, which is a continuation-in-part of Ser. No. 859,354, Sept. 19, 1969, abandoned, which is a continuation-in-part of Ser. No. 628,086, April 3, 1967, abandoned. This application July 24, 1972, Ser. No. 274,724

Claims priority, application Japan, Feb. 26, 1965, 40-11113; Nov. 20, 1965, 40-71830; Dec. 3, 1965, 40-74317; Apr. 14, 1966, 41-23707

Int. Cl. H01f *1/00*

U.S. Cl. 148—120 **1 Claim**

1. A method of preparing a magnetic material comprising the steps of:

a. mixing 40 to 60 atomic percent platinum, 4 to 15 atomic percent iron, 0 to 5 atomic percent nickel, 0 to 5 atomic percent copper, and the balance to 100 atomic percent cobalt, the cobalt being present in an atomic proportion exceeding that of the iron, with a deoxidation and desulfurization metal selected from the group which consists of manganese, aluminum and titanium, the metal being present in an amount between 0.01 and 5 percent by weight of the mixture;

b. melting said mixture and casting the melt into a body;

c. heating said body to a temperature between substantially 900°C and 1,400°C and above the lattice-disorder transition temperature for a period in excess of 1 hour;

d. thereafter swaging said body to a diameter of approximately one fourth the diameter of the cast body and a cross section of about one sixteenth the cross section of the cast body in two to five stages; and

e. heat treating said body at a temperature ranging between substantially 500°C and 800°C for a period of at least one hour and sufficient to reorder the lattice.

3,860,459

INGOT MOULDS

William Ormond Thomas, Glamorgan, and Cyril Dawson Harle, Newport, both of Wales, assignors to British Steel Corporation, London, England

Filed Feb. 19, 1974, Ser. No. 443,516

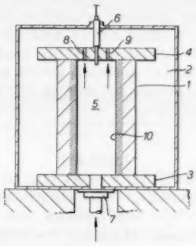
Claims priority, application Great Britain, Feb. 20, 1973, 8367/73

Int. Cl. B28b *7/00;* **C22c** *37/00, 37/04*

U.S. Cl. 148—138 **25 Claims**

13. A process for producing a cast iron ingot mould having a matrix incorporating graphite comprising heat-treating the mould so that an inner region of the mould surrounding the

mould cavity has a matrix which is predominantly pearlitic in structure and an outer region of the mould surrounding the



inner region has a matrix which is predominantly ferritic in structure.

3,860,460

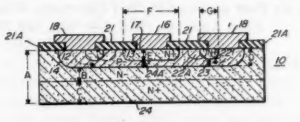
METHOD OF MAKING A TRANSISTOR HAVING AN IMPROVED SAFE OPERATING AREA

Richard O. Olson, 3309 E. 85th Pl., Scottsdale, Ariz. 85251

Division of Ser. No. 321,880, Jan. 8, 1973,. This application Dec. 3, 1973, Ser. No. 420,834

Int. Cl. H01l *7/44*

U.S. Cl. 148—186 **5 Claims**



1. The method of making a transistor device comprising the following steps:

a. providing a collector of one conductivity type,

b. forming a base region of the opposite conductivity type on said collector,

c. diffusing an emitter into said base to form a junction therewith, the surfaces of said emitter and base being in a common plane,

d. forming ohmic contact metallizations over each of said emitter and base,

e. forming an isolation layer over said junction and between said ohmic metallizations, and

f. forming a pinch resistor in the base between said base ohmic metallization and said emitter.

3,860,461

METHOD FOR FABRICATING SEMICONDUCTOR DEVICES UTILIZING COMPOSITE MASKING

William C. Robinette, Jr., Rosenberg, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 29, 1973, Ser. No. 364,981

Int. Cl. H01l *7/44*

U.S. Cl. 148—187 **8 Claims**

1. In a method for fabricating a semiconductor device, the steps comprising:

forming a first layer comprising silicon dioxide on a surface of a body of silicon semiconductor material;

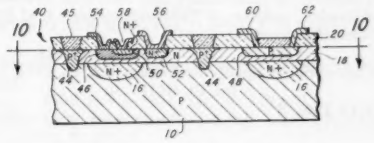
forming a preselected pattern of openings in said first layer to expose preselected regions of said silicon material, said exposed portions being precisely spaced with respect to one another to define a composite diffusion mask;

forming a second layer comprising silicon nitride on said exposed silicon regions and on said composite diffusion mask;

forming a first preselected pattern of openings in said second layer in registry with a first set of said openings in said first layer;

doping the preselected regions at the surface of said body of semiconductor materials exposed by said first set of openings in said first layer with conductivity-type-determining impurities to form regions of preselected conductivity-type in the body of semiconductor material;

forming a third layer comprising silicon nitride over the resultant structure;



patterning said third layer to define a second preselected pattern of openings corresponding with a second set of said openings in said first layer;

removing portions of said second layer exposed by said second pattern of openings, thereby exposing a second set of locations at the surface of said substrate; and

doping said second set of locations with conductivity-type-determining impurities.

3,860,462

PROPELLANT COMPOSITION OF THE NITROCELLULOSE TYPE CONTAINING NON LEAD-CONTAINING BALLISTIC MODIFIERS

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 9, 1970, Ser. No. 14,822

Int. Cl. C06b *3/02*

U.S. Cl. 149—19.8 **7 Claims**

1. In a propellant composition classified as a smokeless type propellant of the nitrocellulosic variety employing ballistic additives, the improvement in smokelessness of said propellant composition achieved by employing ballistic additives in the form of metallic compounds in said composition, said metallic compounds being selected from the group consisting of organometallic salts of lanthanum, hafnium, tantalum, and barium and oxides of lanthanum, hafnium, tantalum, and barium.

3,860,463

PROPELLANT COMPOSITION CONTAINING TRIFERROCENYLMETHYL PERCHLORATE AS CATALYTIC OXIDIZER

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 11, 1968, Ser. No. 783,154

U.S. Cl. 149—19.9 **10 Claims**

1. A solid propellant composition comprising a polymeric binder, a metal, and triferrocenylmethyl perchlorate.

3,860,464

OXIDE ETCHANT

William Charles Erdman, Danielsville, and Victor Charles Garbarini, Bethlehem, both of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 11, 1973, Ser. No. 405,564

Int. Cl. C09k *3/00*

U.S. Cl. 156—7 **8 Claims**

1. Metal inhibited oxide etchant comprising the following components by volume based upon the total volume of etchant:

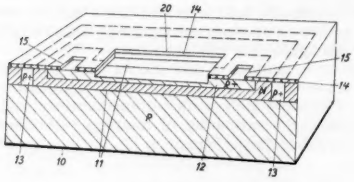
a. 1–3 percent hydrogen peroxide, 30 percent solution
b. 0.02–0.05 percent tetrazolium salt, and
c. buffered aqueous hydrofluoric acid solution,
enough solvent being present to stabilize the solubility of the tetrazolium salt.

3,860,465

METHOD FOR OBTAINING AN ACCURATELY DETERMINED HIGH RESISTANCE IN A RESISTOR PRODUCED IN A SINGLE CRYSTALLINE SUBSTRATE

Eva Matzner, Stockholm, and Olaf Sternbeck, Bromma, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Feb. 1, 1973, Ser. No. 328,515
Claims priority, application Sweden, Feb. 15, 1972, 1790/72
Int. Cl. H01l *7/50*
U.S. Cl. 156—8 **5 Claims**



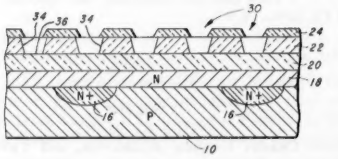
1. A method for obtaining an accurately determined high resistance in a resistor produced in a single crystalline substrate in the form of a diffused region, limited in length, width and depth direction, which region is covered with an oxide layer and is provided with a first and a second window in the oxide layer for connection of two terminal contacts, the method comprising the steps of making a third window in the oxide layer on the top of the diffused region, and then etching the diffused region in the depth direction through said third window for a determined time period, said determined time period being selected so that such a quantity of material is removed that the resistance of the quantity of material remaining in the diffused region, measured between the first and said second windows equals a predetermined resistance value.

3,860,466

NITRIDE COMPOSED MASKING FOR INTEGRATED CIRCUITS

Wilton L. Workman, and Billy M. Martin, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 22, 1971, Ser. No. 191,666
Int. Cl. C23f *1/02;* **B29c** *17/08*
U.S. Cl. 156—11 **4 Claims**



1. A method for plural-stage thin-film masking of a substrate comprising:
a. forming a first adherent, thin-film mask of a material resistant to a first etchant on a surface of said substrate, said mask having a pattern of apertures therein selected to provide accurate spacing between a plurality of substrate locations;
b. forming a second adherent, thin-film mask of a material resistant to a second etchant, but not to said first etchant, on said first mask, said second mask having a pattern of apertures therein which exposes only a first preselected number of the apertures in said first mask; and
c. subsequently forming a third mask, be selective etching with said first etchant, on said first mask, said third mask having a pattern of apertures therein selected to expose only a second preselected number of the apertures in said first mask.

3,860,467

METHOD OF ETCHING A SURFACE OF A SUBSTRATE COMPRISING $LiTaO_3$ AND CHEMICALLY SIMILAR MATERIALS

Mahn-Jick Lim, Lower Makefield Township, Bucks County, Pa., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Feb. 22, 1974, Ser. No. 445,039
Int. Cl. H01l *7/50*
U.S. Cl. 156—17 **4 Claims**

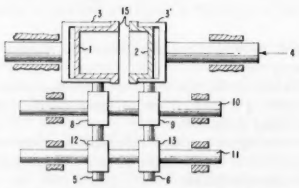
1. A method of etching a surface of a substrate comprising $LiTaO_3$, which comprises contacting the surface with a mixture comprising HF present in an amount ranging from about 42.172 to about 47.535 molal and H_2SO_4 present in an amount ranging from about 40.173 to about 3.354 molal.

3,860,468

ANGULAR WELDING PROCESS AND APPARATUS

Richard A. Scherer, Geneva-Cointrin, Switzerland, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 10, 1973, Ser. No. 349,708
Int. Cl. B32b *31/16*
U.S. Cl. 156—73.5 **13 Claims**



1. A method of friction welding two thermoplastic resin parts together in predetermined alignment with each other which comprises oscillating the two parts relative to one another through a displacement of small amplitude, thereby setting up a relative vibration between the two parts whereby opposing forces are substantially equal while pressing the two parts into surface contact with each other for a time sufficient to melt the contacting surfaces by frictionally induced heat, stopping the relative vibration with the parts in predetermined alignment, and holding the parts in predetermined alignment with said surfaces pressed into contact with each other until the melted thermoplastic resin hardens.

3,860,469

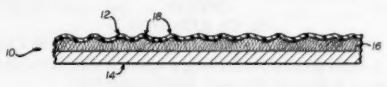
METHOD OF MAKING A LEATHER-LIKE TEXTURIZED LAMINATE

Razmic S. Gregorian, Aiken, S.C., and Hans R. Hoernle, Augusta, Ga., assignors to United Merchants and Manufacturers, Inc., New York, N.Y.

Continuation of Ser. No. 217,844, Jan. 14, 1972, abandoned. This application Apr. 18, 1974, Ser. No. 460,407
Int. Cl. B32b *27/24, 7/08, 31/22, 3/10;* **B29c** *27/00*
U.S. Cl. 156—83 **9 Claims**

2. A method for producing a leather-like texturized laminate comprising securing a facing layer of a flexible continuous film composed of a material selected from the group

consisting of urethanes, vinyl, acrylic, polyamides, polyesters, polyethylene, polypropylene, and silicone, to a backing layer of a textile fabric having upstanding napped or looped fibers secured to one side thereof, the facing layer being secured to the napped or looped fibers of the backing layer such that the backing and facing layers are spaced apart from but movable



within a plane with respect to each other and then expanding the facing layer such that the ratio of the unit area of the facing layer to the unit area of the backing layer is greater than the same ratio prior to the securement of the layers to one another and to produce in the surface of the facing layer, high and low portions which appear as ripples, puckers, and wrinkles, on the facing layers.

3,860,470

PROCESS FOR MAKING MASTER TEXTURED COPIES FOR USE IN MAKING TEXTURED LAMINATES

Richard Frederick Jaisle, Harrison; Donald Joseph Albrinck, and Gene Edward Grosheim, both of Cincinnati, all of Ohio, assignors to Formica Corporation, Cincinnati, Ohio

Continuation-in-part of Ser. No. 75,243, Sept. 24, 1970, abandoned, which is a continuation-in-part of Ser. No. 60,652, Aug. 3, 1970, abandoned. This application Apr. 5, 1973, Ser. No. 348,356

Int. Cl. B29c *25/00*

U.S. Cl. 156—85 **4 Claims**

1. A process of heat-stabilizing by shrinking a heat and pressure consolidated textured laminated master copy unitary structure composed of a plurality of thermosetting resin impregnated fibrous paper sheets which resin has been cured to an infusible-insoluble thermoset state comprising heating said structure in an air circulated oven at a temperature varying between 110°C. and 145°C. for a period of time varying inversely between about 24 hours and 100 hours in order to shrink the structure until it is no longer prone to further significant shrinkage or distortion of the surface texture when subjected to further heating in the manufacture of textured decorative laminates.

3,860,471

CERAMIC DECALCOMANIA

Louis A. Blanco, Tuckahoe, and Hazel W. Meade, Pleasantville, N.Y., assignors to Commercial Decal, Inc., Mt. Vernon, N.Y.

Division of Ser. No. 110,261, Jan. 27, 1971, Pat. No. 3,772,049, which is a continuation-in-part of Ser. No. 727,649, May 8, 1968, abandoned. This application Apr. 9, 1973, Ser. No. 348,880

Int. Cl. C04b *41/06, 33/34*

U.S. Cl. 156—89 **14 Claims**

1. A method for decorating a ceramic ware, which comprises the steps of bonding a decalcomania to a ceramic ware employing a bonding agent which consists essentially of from about 20 to about 70 percent of a fast-acting solvent, selected to act on the organic material in the decalcomania, which is selected from the group consisting of mono-hydric alcohols containing up to about 6 carbon atoms, lower alkyl monoethers of C_2 to C_8 glycols wherein the alkyl groups have up to about 6 carbon atoms, aliphatic or cycloaliphatic ketones, C_2 to C_5 esters of acetic acid and/or lactic acid, terpene solvents, aliphatic hydrocarbons, aromatic hydrocarbons, nitrogen containing heterocyclic compounds and mixtures thereof, and from about 30 to about 70 percent of a moderating agent, selected to moderate the action of the solvent on the organic material, which is selected from the group consisting of the secondary or tertiary terpene alcohols, glycol compounds containing from about 2 to about 12 carbon atoms selected from the group consisting of propylene glycol, butylene glycol, pentylene glycol, hexylene glycol, octylene glycol, decylene glycol, and dodecylene glycol, and mixtures thereof, and mixtures of one or more thereof with water, said ceramic ware including an unfired glaze layer disposed under or over said decalcomania, and firing said ceramic ware including said glaze, bonding agent and said decalcomania to bond said decalcomania to said ware in a single firing operation.

3,860,472

METHOD FOR MANUFACTURING A SYNTHETIC LEATHER BASE

Marc Derville, Bondues, France, assignor to Cursel, Ranbaix, France

Filed July 6, 1971, Ser. No. 159,637

Claims priority, application France, July 7, 1970, 70.25220; June 24, 1971, 71.23135

Int. Cl. B32b *5/06;* **D04h** *18/00;* **B29j** *1/04*

U.S. Cl. 156—148 **9 Claims**

1. Method of manufacturing a synthetic leather base exhibiting a homogeneous cross-section, comprising preparing a thick, homogeneous sheet of high density from synthetic fibers, said fibers having a denier less than 3, a curl frequency over 6, a curl ratio over 10 and a curl permanence over 50 percent, said method being a continuous method and including four successive phases, the first phase consisting of preparing two continuous non-woven primary sheets from said fibers, the second phase consisting of needling the two primary sheets separately from one side only with needles striking in the same direction, the third phase consisting of turning over one of said primary sheets and superposing the two thus needled primary sheets such that the surfaces which have been initially contacted with the needles are on the outside of the sheet formed by their superposition, and the fourth phase consisting of subjecting the sheet thus formed to intense needling from both sides, applying a curable binder through the resulting sheet, curing said binder so as to bind together the fibers to form a bound sheet and subjecting the bound sheet to splitting operations dividing it into layers of the desired thickness.

3,860,473

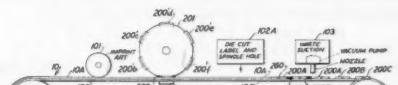
METHOD FOR MAKING PRESSURE SENSITIVE LABEL RECORDS

Glen L. Wesen, 1193 E. 56th St., Brooklyn, N.Y. 11234

Continuation-in-part of Ser. No. 838,796, July 3, 1969, abandoned. This application Feb. 3, 1972, Ser. No. 214,751

Int. Cl. B32b *31/00*

U.S. Cl. 156—252 **4 Claims**



1. A method for forming a container having a plastic record surface having modulated grooves for reproducing sound, said method comprising the steps of; providing a self-adhesive label laminate having a relatively flexible, thin plastic label face removably sticking by means of a pressure-sensitive adhesive to a relatively thick and rigid backing; impressing on said label face a record surface having modulated spiral grooves for reproducing sound, to provide a label record; forming a spindle receiving aperture in said label face; providing a container; forming a predetermined alignment area on a surface of one side of said container; cutting a label record from said label face; vacuum sucking said label record to remove said

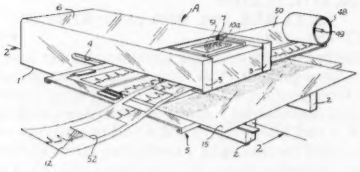
label record from said backing, and simultaneously air blowing said thus removed label record to position said label record to adhere to said container at said predetermined area, said label record adhering to said container by means of said adhesive.

3,860,474

ELECTROCARDIOGRAM MOUNTING METHOD

Paul U. Larson, 6214 Washington Ave., St. Louis, Mo. 63130

Division of Ser. No. 161,731, July 12, 1971, Pat. No. 3,755,047. This application Mar. 13, 1973, Ser. No. 340,825
Int. Cl. B31b *31/00*; B26d *7/00*
U.S. Cl. 156—265 1 Claim



1. In the method of sequentially applying and mounting a plurality of segments of an electrocardiographic tape in an orderly pattern to a medical record sheet comprising fixing the sheet upon a slidably mounted platen and in a position just below where at least one segment of the tape will be positioned, adjusting the platen in two directions to arrange the sheet into position to receive a designated segment of said tape, passing the tape in an overlying relationship across the sheet until the desired segment is aligned for severing and immediate deposition upon the record sheet, severing said tape to free the designated segment of the tape for its immediate descent for deposition and adherence to a specific location on the underlying sheet, and adhering said segment at a designated location on the sheet to provide a permanent medical record of at least one cardiographic reading.

3,860,475

METHOD FOR BONDING ORIENTED POLYESTER FILMS

Walter J. Simmons, Martinsburg, W. Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 16, 1972, Ser. No. 281,165
Int. Cl. C09j *5/02*; B23b *31/00*
U.S. Cl. 156—285 6 Claims

1. In a process for bonding biaxially oriented films of linear polymeric terephthalate esters by applying over the area of juncture of at least one of the film surfaces to be united an agent having at least an incipient solvent action on the film at elevated temperature, bringing the surfaces together and thereafter applying pressure and heat at an elevated temperature to bond the films,

the improvement which comprises continuously bonding the films at a sealing speed of at least ten feet per minute while impinging over the area of juncture a gas stream delivered from a jet positioned from one thirty-second to one-half inch from the surface of the juncture at a linear velocity of at least 100 feet per second, the gas stream being maintained at a temperature of about 290℃ to about 700℃., the film surfaces in the area of juncture being held in intimate contact for bonding solely by the force of the gas stream.

3,860,476

METHOD OF FORMING REFRACTORY LAMINATES

Earl P. Moore, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 148,959, June 1, 1971, Pat. No. 3,767,458, which is a continuation-in-part of Ser. No. 49,915, June 25, 1970, abandoned. This application May 7, 1973, Ser. No. 357,523
Int. Cl. B32b *31/00*
U.S. Cl. 156—297 10 Claims

1. A rapid process for forming a refractory laminate on the surface of a support structure which comprises:

a. dipping the surface in a bath comprising at least one member of the group consisting of a sol of negatively charged colloidal particles selected from the group consisting of silica, bentonite, attapulgite and kaolinite and a solution of an alkaline ionic silicate to form a layer on the surface,

b. contacting the layer on the surface with refractory stucco grains containing a setting agent to firmly set the layer, the setting agent being selected from the group consisting of monofunctional cationic organic compounds having at least one and no more than two alkyl chains of from 6 to 25 carbon atoms, polycationic organic monomers having from 1 to 24 carbon atoms per functional group, polycationic organic polymers having from 1 to 24 carbon atoms per functional group, positively charged colloidal particles selected from the group consisting of alumina and a silica core coated with a metal-oxygen compound and basic aluminum salts having the general formula

$$Al_x(OH)_yA_z$$

wherein $x = 1 - 8$, $y = 1 - 20$, $z = 1 - 4$ and A is an acid anion,

c. repeating steps (a) and (b) in sequence as required to build a refractory laminate of the desired thickness.

3,860,477

METHOD OF BONDING USING NITROCELLULOSE CONTAINING ADHESIVE COMPOSITIONS

Craig E. Johnson, Indian Head, and Larry D. Henderson, Bryans Rd., both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 265,934, June 23, 1972, Pat. No. 3,758,325. This application June 13, 1973, Ser. No. 369,626
Int. Cl. C09j *5/02*; C06b *5/00*; B32b *15/08*
U.S. Cl. 156—331 4 Claims

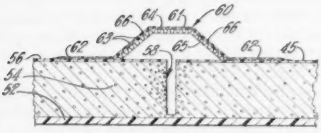
1. In a method of gluing together the parts of a cartridge device by means of filling a propellant chamber with a propellant, then placing an adhesive on said chamber in amounts sufficient to adhere an additional piece to said chamber, and then adhering said additional piece to said chamber, the improvement which comprises utilizing, as said adhesive, an adhesive composition which is a mixture of a component A with a component B wherein said component A comprises, on a weight percent basis, 20–80% of trimethylol ethane trinitrate, 0.1 to 2% of ethyl centralite and 20–80 percent of a nitrocellulose compound selected from the group consisting of plastisol nitrocellulose and pelletized nitrocellulose; and said component B comprises, on a weight percent basis, from 0.005 – 0.3 percent of dibutyltin dilaurate, 0.1 – 2 percent of ethyl centralite and a remainder of triethyleneglycol dinitrate; with the proviso that said adhesive composition is applied to said chamber during the pot life of said adhesive composition; and with the further proviso that when said chamber has a metallic surface, a primer to which the adhesive will bond is first applied to the metallic surface.

3,860,478

SLITTED INSULATING RIGID WALL COMPOSITE

David H. Bartlow, and Mark E. Greenwood, both of Huntingdon, Pa., assignors to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Filed July 13, 1972, Ser. No. 271,461
Int. Cl. B32b 3/10, 3/14; B65d 15/16
U.S. Cl. 161—117 6 Claims



1. A rigid composite wall for fluid handling devices which is adapted for expansion and contraction, comprising:

two layers of fiber reinforced plastic adhered together by an intermediate layer of rigid cellular insulation such that expansion or contraction of one plastic layer will impart a stress to the other plastic layer through the cellular layer, one of the plastic layers having a slit through it effective to allow it to expand or contract in response to expansion or contraction of the other plastic layer; and

a reinforced plastic member overlaying the slit comprising: two base sections spaced on opposite sides of the slit and joined to the slit layer of plastic; and a bridging portion spaced from the slit layer and connecting said base sections such that the base sections can move toward and away from each other in response to expansion or contraction of the slit layer.

3,860,479

CATALYTIC OXIDATION OF ALKALINE PULPING LIQUOR

Richard G. Barker, Princeton Junction, N.J., and Edward S. Becker, Delta, British Columbia, Canada, assignors to Union Camp Corporation, Wayne, N.J.

Continuation of Ser. No. 154,356, June 18, 1971, abandoned.
This application Dec. 14, 1973, Ser. No. 424,671
Int. Cl. D21c 3/24
U.S. Cl. 162—79 29 Claims

1. In a process for converting the sulfide in paper pulping liquor to polysulfide liquor by oxidation with a gas selected from oxygen and oxygen containing gases, the improvement which comprises catalyzing said oxidation with a catalyst selected from metal oxides and metal sulfides.

3,860,480

REACTOR CORE COMPONENT VIBRATION MONITRO

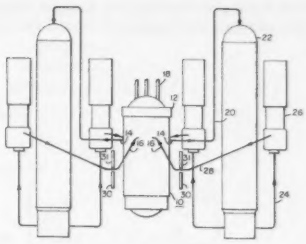
Marc F. M. Carteus, Montignies-Le Tilleul, Belgium; Raj Gopal, Monroeville, Pa., and Derek T. Rawle, Brussels, Belgium, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 29, 1973, Ser. No. 327,522
Int. Cl. G21c 17/00
U.S. Cl. 176—19 R 11 Claims

1. A nuclear reactor pressure vessel core component vibration monitor comprising:

first means, positioned outside the core, responsive to the neutron activity occurring within the core having a spectral component representative of the relative motion of the core to provide outputs indicative thereof; and

second circuit means communicatively coupled with said first means and analytically operable on the outputs



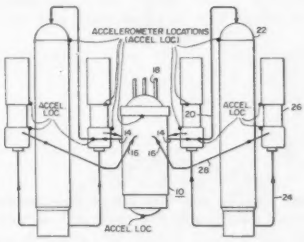
thereof to process the outputs into a measurement indicative of core vibration.

3,860,481

METAL IMPACT MONITOR

Raj Gopal, Monroeville, Pa., and Marc F. M. Carteus, Montignies-le-Tilleul, Belgium, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 29, 1973, Ser. No. 327,539
Int. Cl. C21c 17/00
U.S. Cl. 176—19 R 6 Claims



1. In combination with an apparatus operating in its intended environment, an on-line monitor for measuring impacts produced on a metal component of the apparatus during the normal operation thereof comprising:

a sensor affixedly coupled to the metal component and operable to provide an electrical output representative of the impact energy imparted to the component at the resonant frequency of the component from an extrinsic source existing within the apparatus and impacting on the component during its operation;

means associated with said sensor output for providing a first signal representative of the rate at which impacts occur; and

means associated with said sensor output for providing a second signal representative of the impact energy level.

3,860,482

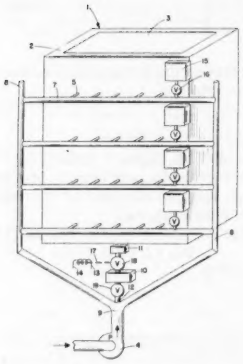
REACTOR REACTIVITY CONTROL BY COOLANT PASSAGE COATING

Clifford W. Wheelock, Canoga Park, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Sept. 25, 1957, Ser. No. 686,262
Int. Cl. G21c 7/22
U.S. Cl. 176—22 1 Claim

1. A method of controlling reactivity in a nuclear reactor which is cooled by water flowing through coolant channels within the reactor core, said coolant channels being of a metal selected from the group consisting of aluminum and stainless

steel, which comprises providing a neutron absorbing solution consisting of a cadmium compound selected from the group consisting of cadmium chloride and cadmium fluoborate, together with hydrogen fluoride, said solution being about 3 molar in the cadmium compound and about 1 molar in hydrogen floride, injecting said solution at a predetermined flux level into said water flowing through said coolant channels, circulating said solution through said channels and thereby causing at least part of said cadmium from said solution to deposit on the interior walls of said channels, thereby reducing the neutron multiplication factor of said reactor.



3,860,483

NOVEL METHOD OF DIAGNOSIS OF SCHISTOSOMIASIS AND REAGENTS THEREFORE

Alfred W. Senft, Providence, R.I., assignor to Research Corporation, New York, N.Y.

Filed Mar. 21, 1972, Ser. No. 236,617
Int. Cl. C07g *7/026;* **A61k** *19/00*
U.S. Cl. 195—62 **27 Claims**

1. A process for isolating proteinaceous enzymetic material from Schistosomes which comprises the steps of:

a. lyophilizing *S. mansoni* worms,

b. homogenizing the lyophilizate of (a) in a buffer having a pH of between 3.0 and 4.5,

c. centrifuging the homogenate of (b) at 10 to 25 $\times 10^3$g,

d. concentrating the supernate of (c) by passing up 80–95% thereof through a gel filter having pore size with an exclusion of 10,000 M. W. under pressure of inert gas,

e. subjecting the residual supernate of (d) to dextran gel chromatography using an eluent of pH 3.5 to 4.5,

f. measuring the optical absorbance of the eluate at 280nm, and

g. isolating those fractions whose absorbance falls between the first and third principal absorption maxima of (e and f).

3,860,484

ENZYME STABILIZATION

James Joseph O'Malley, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 28, 1972, Ser. No. 293,255
Int. Cl. C07g *7/02*
U.S. Cl. 195—63 **8 Claims**

5. An enzymatically active, bio-catalytically stabilized aqueous composition comprising an oxidoreductase enzyme in intimate association with a polymer selected from the group consisting of copolymers of polyvinyl pyrrolidone and polyvinyl acetate, and copolymers of polyvinyl alcohol and polyvinyl acetate.

3,860,485

PREPARATION OF OLIGOMERS OF MICROENZYMES

Roy U. Schenk, 411 S. Brooks St., Apt. 2, Madison, Wis. 53715, and Johan Bjorksten, 4601 Fish Hatchery Rd., Rt. 4, Madison, Wis. 53711

Continuation of Ser. No. 240,692, April 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 222,232, Jan. 31, 1972, abandoned. This application Aug. 28, 1973, Ser. No. 392,298
Int. Cl. C07g *7/02*
U.S. Cl. 195—66 R **3 Claims**

1. A method for producing oligomers of proteolytic microenzymes, which comprises growing a spore forming organism in a culture medium, removing solid matter from said medium, forcing said medium through an ultrafilter membrane retaining molecules larger than about 10,000 Mol. Weight to provide an ultrafiltrate containing a proteolytic microenzyme concentrating said ultrafiltrate an amount so that at least 90 percent oligomers result by equilibration, equilibrating said concentrated ultrafiltrate to oligomerize said microenzyme to produce at least 90 percent oligomers and separating said oligomers from the ultrafiltrate by forcing said concentrated ultrafiltrate through an ultrafilter membrane which retains molecules larger than about 10,000 mol. weight.

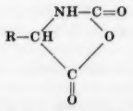
3,860,486

INSOLUBILIZING ENZYMES WITH POLYSTYRENE DERIVATIVES

Melvin H. Keyes, Toledo, and Frank E. Semersky, Fostoria, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed May 24, 1973, Ser. No. 363,676
Int. Cl. C07g *7/02*
U.S. Cl. 195—68 **4 Claims**

1. A method of rendering enzymes water insoluble which comprises reacting an enzyme in an aqueous alkaline medium at a temperature of about 0°C. with a polystyrene compound of the formula



is which R is poly(chloromethylstyryl) wherein a minor portion of the chloro groups is substituted by 2,5-dioxo-4-oxazolidine and recovering the resultant product.

3,860,487

PROCESS FOR GROWING BACTERIA OR FODDER

Carl F. Emanuel, deceased, late of Bellevue, Wash. (by Mary Victoria Emanuel, administratrix), assignor to The Boeing Company, Seattle, Wash.

Division of Ser. Nos. 313,788, Dec. 11, 1972, , and Ser. No. 207,488, Dec. 13, 1971, abandoned, said Ser. No. 313,788, is a continuation-in-part of Ser. No. 207,488,. This application June 12, 1974, Ser. No. 478,463

Int. Cl. C12d *13/00*

U.S. Cl. 195—96 7 Claims

1. The method of treating poultry feces which comprises digesting a mixture of water and comminuted poultry feces for dissolving soluble components from the feces, separating the solid phase from the liquid phase of the mixture existing immediately at the completion of the digesting step and thereby obtaining a body of liquid segregated from the solid phase which body of liquid contains substantially all of the soluble ingredients, removing at least one selected dissolved ingredient from such segregated body of liquid phase after its separation from the solid phase to provide a remaining body of liquid of the liquid phase, and then growing either bacterial culture or green fodder in said remaining body of liquid of the liquid phase.

PROTEINS

3,860,488

PROCESS FOR THE AEROBIC CULTIVATION OF MICROORGANISMS

Peter Garfield Cooper, III, Verona, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Division of Ser. No. 278,477, Aug. 7, 1972,. This application May 2, 1974, Ser. No. 466,421

Int. Cl. C12b *1/14*

U.S. Cl. 195—109 23 Claims

1. A process for the aerobic cultivation of a microorganism which comprises introducing an aqueous nutrient medium, an assimilable carbon source and a viable culture of a microorganism into a fermentation vessel having an L/D of about one-half to about one-twentieth where L is the height of said vessel and D is the length of one side of said vessel having a square cross-sectional configuration or the diameter of said vessel having a circular cross-sectional configuration, said vessel containing at least one draft tube; introducing gas containing free oxygen into the lower portion of the fermentation mass thus formed in said vessel, said gas being introduced in an amount sufficient to effect (1) growth of said mircroorganism, (2) agitation of said fermentation mass and (3) removal of the heat of fermentation by evaporation of water from the fermentation mass; continuing the cultivation of the microorganism in the growth-supporting mixture of aqueous nutrient medium, assimilable carbon source and gas containing free oxygen until the cell concentration of the microorganism in the fermentation mass reaches a maximum under logarithmic growth; and thereafter harvesting the cells.

PROTEINS

3,860,489

PROCESS AND APPARATUS FOR THE AEROBIC CULTIVATION OF MICROORGANISMS

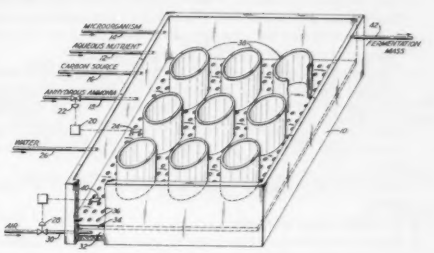
Peter Garfield Cooper, III, Pittsburgh, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Aug. 7, 1972, Ser. No. 278,477

Int. Cl. C12b *1/00*

U.S. Cl. 195—139 10 Claims

1. An improved fermentation vessel for the aerobic cultivation of a microorganism which comprises a vat adapted to hold a fermentation mass and having an L/D of about 1/2 to about 1/20 where L is the height of said vat and D is the length of one side of said vat having a square cross-sectional configuration or the diameter of said vat having a circular cross-sectional configuration, said vat containing at least one draft tube adapted to permit the flow of fermentation mass downwardly within said draft tube and upwardly outside of said draft tube, said vat also containing means for introducing therein aqueous nutrient medium, microorganism, assimilable carbon source, water, gas containing free oxygen and alkaline pH-controlling material and means for withdrawing a fermentation mass therefrom, said means for introducing gas containing free oxygen comprising a plurality of orifices extending over the bottom of the vat except immediately under the draft tubes.



3,860,490

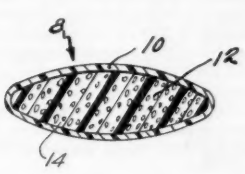
PROCESS OF SUBJECTING A MICROORGANISM SUSCEPTIBLE MATERIAL TO A MICROORGANISM

Alvin Guttag, Bethesda, Md., assignor to National Patent Development Corporation, New York, N.Y.

Division of Ser. No. 225,488, Feb. 11, 1972, Pat. No. 3,767,790. This application Apr. 4, 1973, Ser. No. 347,724

Int. Cl. C12b *1/00*

U.S. Cl. 195—108 11 Claims



1. A process of subjecting a nutrient substrate medium having a living industrial microorganism susceptible material therein to a living industrial microorganism, which comprises contacting the microorganism susceptible material of the substrate with a solid water-insoluble hydrophilic polymer of a member of the group consisting of hydroxy lower alkyl acrylates, hydroxy lower methacrylates, hydroxy lower alkoxy lower acrylates and hydroxy lower alkoxy lower alkyl methacrylates, said polymer having entrapped therein a living industrial microorganism.

3,860,491

REFLUX SPLITTER AND CONTROL SYSTEM THEREFOR

James L. Baird, Winchester; Edmund L. Pessa, Arlington, both of Mass., and James C. Silk, Hudson, N.H., assignors to Artisan Industries Inc., Waltham, Mass.

Filed June 11, 1973, Ser. No. 368,482

Int. Cl. B01d *3/14, 3/00*

U.S. Cl. 202—161 11 Claims

1. A reflux splitter which comprises in combination:

a. a process shell at least a portion of whose wall is composed of a nonmagnetic material, and characterized by a reflux outlet in the process shell wall to discharge reflux externally of the process shell;

b. means to discharge a liquid condensate into the process shell;

c. a reflux condensate-receiving element within the process shell adapted to direct liquid condensate therein to the reflux outlet;

d. movable means to direct liquid condensate discharged into the process shell between a first position wherein the condensate is directed into the reflux outlet, and a second position wherein the condensate is permitted to be discharged downwardly within the process shell;

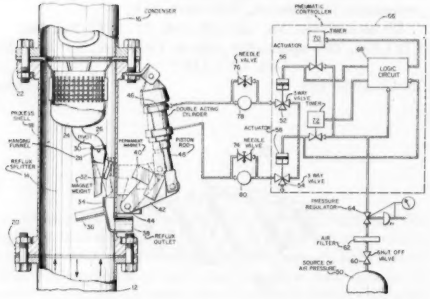
e. a magnetic material secured to the movable means and adapted for movement therewith, the magnetic material adapted to be positioned in either the first or second position of the movable means in a close magnetic flux relationship with the nonmagnetic wall of the process shell;

f. a permanent magnet positioned externally of the process shell;

g. a source of air pressure;

h. means to move the permanent magnet between an actuating position and a nonactuating position, one of said positions placing the permanent magnet in a close magnetic flux relationship with the external nonmagnetic wall of the process shell which comprises,

i. an actuating element adapted for pivotable movement externally of the process shell, the permanent magnet secured to the said element at one end thereof for movement therewith;



ii. a double-acting pneumatic cylinder having a piston thereon and a piston rod, one end of which is secured to the actuating element at the other end thereof to permit reciprocating movement of the element with the movement of the piston rod;

iii. means to supply air pressure from the air pressure source to the cylinder; and

iv. valve means to permit air pressure from the source to be introduced into the cylinder and to be exhausted from the piston; and

i. means to control the time periods at which the means to move the permanent magnet and the permanent magnet is maintained in the actuating and nonactuating positions which comprises an air-actuated cyclic timing means to permit the introduction and exhaustion of air pressure to the cylinder and induces movement of the piston rod, actuating element and permanent magnet between the actuating and nonactuating positions in a sequential predetermined time period, whereby, on movement of the permanent magnet to one of its positions, the magnetic flux of the magnetic force through the nonmagnetic wall of the process shell induces movement of the magnetic material and the means to direct the liquid condensate, so that a reflux ratio as desired may be arranged through the time period in each position.

3,860,492

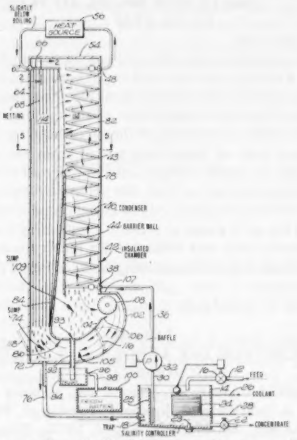
LIQUID SEPARATION SYSTEM

Alvin Lowi, Jr., 2146 Toscanini Dr., San Pedro, Calif. 90732, and Clifford C. Wright, 4638 Browndeer Ln., Palos Verdes Peninsula, Calif. 90274

Filed June 27, 1973, Ser. No. 374,211

Int. Cl. B01b ; B01d *3/00, 1/00, 3/34, 3/08*

U.S. Cl. 202—236 **10 Claims**



1. A vapor staging distillation system for separating liquid from feed material, yielding a concentrate and a condensate comprising:

a vertically extending divider wall;

a vertically extending evaporation section on one side of said divider wall;

a vertically extending condenser section on the other side of said divider wall;

cooling means for condensing vapor in said condenser section;

means for transferring said feed material to said evaporation section at a temperature higher than said cooling means;

means in said evaporation section for providing a plurality of vertically extending thin films of liquid from said higher temperature feed material;

means for conveying a gas stream in cyclic flow from said condenser section to said evaporator section and back to said condenser;

said divider wall having an opening in the top portion thereof appreciable vertical extent, said evaporator and condenser sections communicating directly through said opening whereby vapor from said films in said evaporation section is conveyed by said gas to said condenser section to effect a bleed differential between the top and bottom of said opening;

means for collecting condensate from said condenser section; and

means for collecting concentrate from said evaporation section.

3,860,493

COVER APPARATUS FOR PIPES CONDUCTING DISTILLATION GASES FROM COKE OVENS

Erich E. Pries, Bochum, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed Mar. 4, 1974, Ser. No. 447,977

Claims priority, application Germany, Mar. 6, 1973, 7308485; June 15, 1973, 7322284

Int. Cl. C10b *27/00*

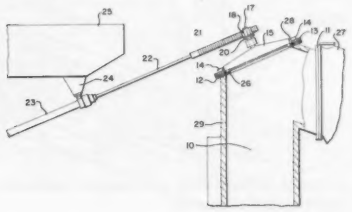
U.S. Cl. 202—254 **11 Claims**

1. The combination of a vertically-extending pipe to conduct distillation gases from a coke oven chamber and a cover

apparatus to serve as a closure for an opening in the wall of said pipe, said apparatus comprising:

a cover having the form of a generally circularly-shaped disc for closing the opening in the wall of said pipe, the disc defining a projecting rim surface having a diminishing taper,

shaft means extending from the back of said cover and generally coaxial with the central axis of said rim surface, pivotal means carrying said cover for rotation about the central axis of said rim section,



a flange surrounding the opening in the wall of said pipe for contact with said projecting rim surface in a gas sealing relation,

means for transmitting torque to said stub shaft for in situ rotation of said cover while in contact with said flange, and

scraper means projecting from said flange at spaced-apart locations for dislodging encrusted deposits projecting from said cover upon in situ rotation thereof.

3,860,494

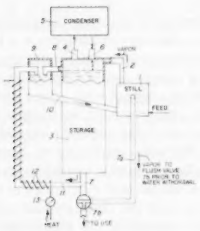
PROCESS FOR PRODUCING AND MAINTAINING PURIFIED, STERILE WATER

Kenneth C. D. Hickman, Rochester, N.Y., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Aug. 29, 1972, Ser. No. 281,667

Int. Cl. B01d *3/00, 3/10;* **F28d** *15/00*

U.S. Cl. 203—10 **3 Claims**



1. In a process for producing purified sterile water from impure water wherein said impure water is evaporated and condensed, and the resultant distillate is collected in a vertically disposed storage zone having a permanent blanket of steam above said distillate, said steam being supplied by evaporation of said impure water, the improvement comprising supplying fresh distillate from evaporation of said impure water and the condensation of the resulting vapors thereof as said fresh distillate, to the upper end of said storage zone which is already substantially filled with steam-blanketed distillate, simultaneously removing some distillate from said zone while maintaining said zone in a substantially filled condition, recycling said removed distillate back to said evaporation step for repurification, the major amount of said removed distillate being withdrawn from said storage zone at a point substantially removed from the point of distillate entry into said zone, whereby said removed distillate is mainly composed of distillate that has resided in said storage zone for an extended period of time.

3,860,495

PROCESS FOR THE PURIFICATION OF CRUDE ACROLEIN BY EXTRACTIVE DISTILLATION

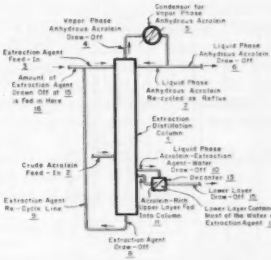
Marcel Borrel, Oullins; Henri Mathais, Ste-Foy-Les-Lyon, and Marcel Thevenon, Lyon, all of France, assignors to Produits Chimiques Ugine Kuhlman, Paris, France

Filed June 8, 1970, Ser. No. 44,165

Claims priority, application France, June 9, 1969, 69.18905

Int. Cl. B01d *3/40;* **C07c** *47/22*

U.S. Cl. 203—17 **11 Claims**



1. In a process for the purification of crude acrolein which comprises feeding crude acrolein containing at least water as an impurity and an extraction agent into a distillation column, distilling the crude acrolein feed mixture condensing the vapor phase anhydrous acrolein formed at the head of the column, recycling part of the condensate not recovered as end-product, withdrawing from the base of the column a liquid phase consisting essentially of a mixture of extraction agent and water, distilling the liquid phase withdrawn from the base of the column to remove the water and recycling the recovered anhydrous extraction agent, the improvement which comprises:

drawing-off a liquid phase consisting essentially of acrolein, extraction agent and water through an outlet situated between the crude acrolein inlet and the base of the column, the extraction agent characterized by possessing the ability to extract acrolein from the crude acrolein and having a boiling point in excess of that of water;

separating the liquid phase withdrawn from said outlet into an acrolein-rich upper layer and an aqueous lower layer; recycling the acrolein-rich upper layer into the column; discharging the aqueous lower layer; drawing-off liquid phase anhydrous extraction agent from the base of the column; and recycling the liquid phase anhydrous extraction agent into the column.

3,860,496

PROCESS FOR THE RECOVERY OF ISOPRENE FROM MIXTURES CONTAINING THE SAME

Alessandro Ginnasi, and Carlo Rescalli, both of San Donato Milanese, Italy, assignors to Snam Progetti, S.p.A., San Donato Milanese, Italy

Filed Dec. 29, 1971, Ser. No. 213,544

Claims priority, application Italy, Dec. 29, 1970, 33613-A/70

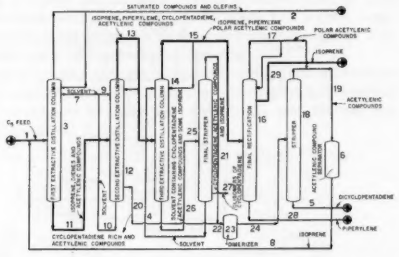
Int. Cl. B01d *3/34*

U.S. Cl. 203—28 **4 Claims**

1. A process for the recovery of isoprene from mixtures of C_5 hydrocarbons containing isoprene, cyclopentadiene and acetylenic hydrocarbons which comprises:

a. extractively distilling a C_5 hydrocarbon feed in a first extractive distillation column in the presence of a solvent for recovering isoprene said solvent being selected from the group consisting of N-formyl morpholine-water and N-formyl morpholine-morpholine-water; said solvent containing from 1–25% water, and withdrawing from the top of said first extractive distillation column the olefinic and saturated hydrocarbon in said C_5 hydrocarbon feed; and withdrawing the bottom product from said first extractive distillation column;

b. passing said bottom product from said first extractive distillation column to a second extractive column and withdrawing from the top of said second extractive distillation column the overhead product; and withdrawing from the bottom said solvent which is divided and recycled to the upper portion of said first and second extractive distillation columns;



c. withdrawing a cyclopentadiene containing sidestream from said second extractive distillation column;

d. passing the overhead product obtained from said second extractive distillation column to a third extractive distillation column that is provided with a solvent for recovering isoprene said solvent being selected from the group consisting of N-formyl morpholine-water and N-formyl morpholine-morpholine-water said solvent containing from 1–25% of water; and obtaining from the bottom of said third extraction column a product which is stripped of said solvent for recovering isoprene, said solvent being recycled to the upper part of said third extraction column; and withdrawing the overhead product from said third extractive distillation column and recovering the isoprene therefrom in a final rectification.

3,860,497

MULTI-STAGE DISTILLATION OF BICYCLOHEPTADIENE

John C. Rapean, and Paul V. Shaw, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 2, 1973, Ser. No. 356,684
Int. Cl. B01d *3/00, 3/10*
U.S. Cl. 203—82 **2 Claims**

1. A continuous process for separating bicyclo-(2,2,1)-hepta-2,5-diene from cyclopentadiene, dicyclopentadiene and other impurities of its production by the acetylene/cyclopentadiene condensation reaction which process comprises

a. introducing said bicycloheptadiene together with said impurities into a first fractionation distillation zone,

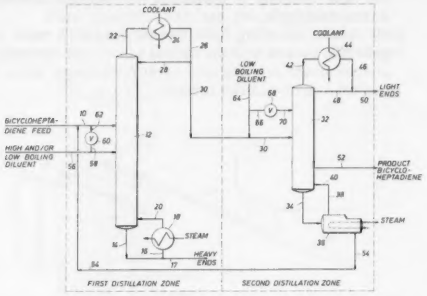
b. introducing into the first distillation zone an inert hydrocarbon diluent mixture of one or more of the hydrocarbons selected from the group consisting of C_8 alkanes, C_9 alkanes, toluene, ortho-xylene, para-xylene, and meta-xylene,

c. withdrawing as bottoms dicyclopentadiene and other impurities less volatile than said bicycloheptadiene,

d. passing as overhead said bicycloheptadiene together with more volatile impurities to a second fraction distillation zone,

e. withdrawing as overhead cyclopentadiene and other impurities more volatile than said bicycloheptadiene,

f. withdrawing as an intermediate product said bicycloheptadiene, and



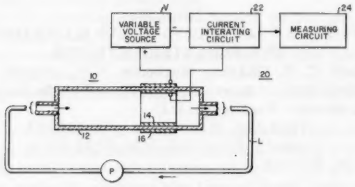
g. recycling bottoms from said second distillation zone to the first distillation zone.

3,860,498

METHOD OF MEASURING O^2 AND O^2 CONTAINING CONSTITUENTS

William J. Jones, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 2, 1973, Ser. No. 376,002
Int. Cl. G01n *27/46*
U.S. Cl. 204—1 T **7 Claims**



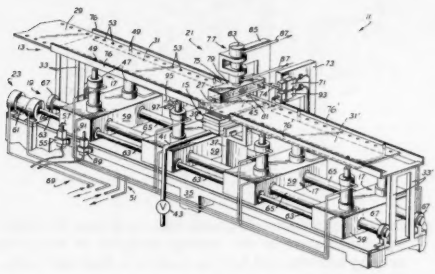
1. A method for measuring the partial pressure of oxygen and oxygen containing constituents of a gas through the use of a solid electrolyte oxygen ion conductive electrochemical cell operating as a pump, comprising the steps of, establishing an oxygen media in contact with a first electrode of an electrochemical cell comprised of an oxygen ion conductive solid electrolyte and first and second electrodes disposed on opposite surfaces thereof, circulating an oxygen-containing gas in a closed loop flow in contact with the second electrode, applying a potential across said electrodes to effect pumping of the free oxygen in said gas through said solid electrolyte to the oxygen media, adjusting the magnitude of said potential to effectively remove all free oxygen from said gas without causing significant dissociation of oxygen from oxygen-containing constituents in said fluid, said pumping of said free oxygen ions producing a cell current, integrating said cell current produced by said pumping of oxygen to produce an electrical signal indicative of the free oxygen contained within said gas, increasing the applied voltage to a magnitude sufficient to dissociate the oxygen contained in said oxygen-containing constituents present within said gas, pumping the dissociated oxygen through said solid electrolyte to said oxygen media, circulating said gas in a closed loop flow across said second electrode until dissociation is substantially complete, and integrating the cell current developed as a result of the pumping of oxygen dissociated from said oxygen-containing constituents as an indication of the oxygen-containing constituent in said gas.

3,860,499

ELECTROPLATING APPARATUS AND METHOD

Earl R. Graham, Athens; Joseph P. Lagermasini, Towanda; Kenneth H. Shaner, Luthers Mills, and David H. Hopkins, Camptown, all of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Apr. 19, 1973, Ser. No. 352,681
Int. Cl. C23b 5/48; B23p 1/02
U.S. Cl. 204—15 19 Claims



1. An apparatus for selectively electroplating a strip of material, said apparatus comprising:

positioning means adapted for receiving said strip of material in said apparatus;

an open-top container adapted for holding a quantity of electrolyte solution therein, said container oriented in linear relationship with said positioning means;

an anode conductor positioned substantially within said open-top container and adapted for applying positive potential to said electrolyte solution within said open-top container;

engagement means oriented relative to said positioning means and adapted for sequentially engaging said strip of material;

advancement means for moving said engagement means a predetermined distance in a substantially rectilinear direction to transfer a portion of said strip to cover said open-top container;

a substantially solid seating means substantially vertically oriented above said open-top container, said seating means adapted for engaging the upper surface of said strip to thereby provide positive seating of said strip on said container;

at least one cathode conductor positioned substantially within said seating means and adapted for applying negative potential to said strip of material; and

retraction means for moving said engagement means said predetermined distance in a direction substantially opposite to said rectilinear direction of said advancement means when said engagement means disengages said strip of material.

3,860,500

PHOTOSENSITIVE COPPER (I) COMPLEXES AND THE USE THEREOF IN PHOTOGRAPHIC DEVELOPMENT

Henry J. Gysling, Rochester, N.Y., assignor to Eastman Kodak Company, New York, N.Y.

Filed May 30, 1973, Ser. No. 365,375
Int. Cl. G03c 5/00, 5/24, 1/00
U.S. Cl. 204—15 21 Claims

1. A photosensitive composition comprising a hydrophilic polymer binder with a light sensitive copper (I) complex represented by the formula $Cu[P(OR)_3]_nBH_3CN$ wherein R is alkyl containing from 1 to 4 carbon atoms and n is an integer from 1 to 3.

15. The process of claim 7 wherein the latent image is developed in a physical development bath comprising a metal salt and a reducing agent therefor.

3,860,501

PHOTOSENSITIVE COPPER (I) COMPLEXES AND THE USE THEREOF IN PHOTOGRAPHIC DEVELOPMENT

Henry J. Gysling, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 30, 1973, Ser. No. 365,376
Int. Cl. G03c 5/00, 5/24, 1/00
U.S. Cl. 204—15 19 Claims

1. A photographic composition comprising a hydrophilic polymeric binder and a copper (I) complex having the formula

$$Cu[P(OR)_3]_4BAr_4$$

wherein R is alkyl containing from about one to six carbon atoms or aryl containing from about 6 to about 12 carbon atoms and Ar is aryl containing from about 6 to about 12 carbon atoms.

6. In a process of developing an image in a light sensitive element comprising a support and a light sensitive copper material imbibed into said support or dispersed in a hydrophilic polymeric binder and coated onto said support by contacting the copper material with a chemical developer comprising a reducing agent or physical developer comprising a metal salt and a reducing agent therefor the improvement comprising employing as said light sensitive copper material a light sensitive copper (I) complex represented by the formula $Cu[P(OR)_3]_4BAr_4$ wherein R is alkyl containing from one to six carbon atoms or aryl containing from 6 to 12 carbon atoms and Ar is aryl containing from 6 to 12 carbon atoms.

3,860,502

ELECTRODEPOSITION OF TIN

William R. Johnson, Penn Township, Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Mar. 25, 1974, Ser. No. 454,057
Int. Cl. C23b 5/14, 5/46
U.S. Cl. 204—54 R 4 Claims

1. In the electroplating of ferrous substrates with a coating of tin, wherein the substrate, immersed in an electroplating bath, is made a cathode by the application of an electrolyzing current thereto, said plating bath being comprised of an acid electrolyte, a tin salt and at least one organic brightening agents dissolved therein,

the improvement which comprises employing from about 1 to about 12 gms per liter of solution of an agent consisting essentially of,

$SO_3H\text{-}C_{10}H_7O\text{-}(\text{-}C_2H_4O\text{-})_nH$

wherein n equals 6 or 7, said agent having been prepared by the ethoxylation of α or β naphthol with said n mols of ethylene oxide and thereafter, at a temperature within the range 50°C – 90°C, sulfonating the resultant product with sulfuric acid, the concentration of which is at least about 90 percent.

3,860,503

METHOD FOR FORMING A COLORED COATING ON ALUMINOUS MATERIALS

Masashi Ikegaya, and Fumio Shigeta, both of Shizuoka, Japan, assignors to Riken Light Metal Industries Co., Ltd., Magarikane, Shizuoka, Japan

Filed July 27, 1972, Ser. No. 275,821
Claims priority, application Japan, July 30, 1971, 46-57348; Aug. 21, 1971, 46-63337; Aug. 21, 1971, 46-63338; Aug. 21, 1971, 46-63339
Int. Cl. C23b 9/02
U.S. Cl. 204—58 7 Claims

1. A method of producing colored oxide coatings ranging from yellow to brown on aluminum or aluminum alloy, which consists essentially of electrolytically anodizing with direct current, an aluminum material selected from the group consisting of aluminum and an alloy thereof in an aqueous solution of 0.5 – 10.0 percent by weight of oxalic acid and 0.05 – 4.0 percent by weight of a salt selected from the group consist-

ing of ammonium phosphate, ammonium dichromate, a metal acetate and a metal nitrate at a temperature of between 0° and 50°C; a voltage of between 5–160 volts, a current density of between 0.05 – 5 A/dm², and for a time of between 10–120 minutes.

3,860,504

PROCESS FOR THE PRODUCTION OF ELEMENTAL FLUORINE BY ELECTROLYSIS

Peter Kaudewitz, and Hubert Friedrich, both of Bad Wimpfen, Germany, assignors to Kali-Chemie Fluor GmbH, Bad Wimpfen, Germany

Filed Mar. 12, 1974, Ser. No. 450,487

Claims priority, application Germany, Mar. 13, 1973, 2312297

Int. Cl. B01k *1/00*

U.S. Cl. 204—59 R **4 Claims**

1. A process for the production of elemental fluorine by electrolysis of an electrolyte consisting essentially of hydrogen fluoride and an alkali metal fluoride in which process the electrolyte contains barium or strontium ions or a mixture of both.

3,860,505

ETHYLENE/C_3–C_8 ALPHA-OLEFIN ELASTOMERS HAVING IMPROVED BUILDING TACK

Robert Edward Tarney, Hockessin, and John J. Verbanc, Wilmington, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 774,494, Nov. 8, 1968, Pat. No. 3,565,841, which is a continuation-in-part of Ser. No. 708,486, Feb. 27, 1968, abandoned. This application Aug. 12, 1970, Ser. No. 63,261

Int. Cl. B01j *1/10*

U.S. Cl. 204—159.12 **11 Claims**

1. An elastomeric copolymer of ethylene and a (C_3–C_8) alpha-olefin tackified by

a. uniformly dispersing therein an organic cyclic resin having at least one polar functional group and a molecular weight of at least 200, said resin being terpenoid resins which are terpenes, rosins, or modified rosins, and

b. exposing the surface of the resulting mixture to ultraviolet light in the presence of oxygen or to ozone to produce a peel tack which is at least one pound per linear inch more than the peel tack of the mixture before exposure.

3,860,506

ELECTROPHORETIC PROCESS FOR COATING CERAMICS

Robert F. Nickerson, Livermore, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Sept. 12, 1966, Ser. No. 578,895

Int. Cl. B01k *5/02*

U.S. Cl. 204—181 **7 Claims**

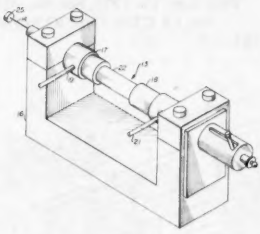
1. In a process for providing a continuous coating directly upon a solid green starch binder-formed, nonconductive body, the steps comprising:

air-firing said nonconductive green body to a starch-burned state in which at least the surface is porous;

contacting said body with a suspension of colloidal graphite particles having a particle size generally as large as the average dimensions of the pores of said porous body to deposit a thin, continuous film of graphite particles on the surface thereof;

disposing said graphite-coated body in an electrophoretic suspension of coating particles and applying an electrical potential between said graphite film and an electrode in said suspension to deposit a continuous coating of said particles over said graphite film;

heating said particle-coated body to a temperature approaching the sintering temperature of the coating particles in a flowing hydrogen atmosphere and maintaining said temperature sufficiently long to convert said graphite film to a gas and diffuse said gas through said particle coating; and



then heating said particle-coated body to at least the sintering temperature of the coating particles to sinter the coating particles and fire the body to a final hard form.

3,860,507

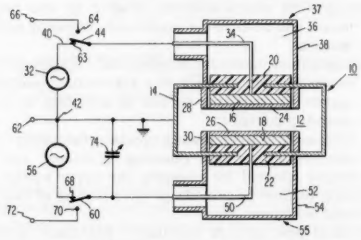
RF SPUTTERING APPARATUS AND METHOD

John Louis Vossen, Jr., Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 29, 1972, Ser. No. 310,446

Int. Cl. C23c *15/00*

U.S. Cl. 204—192 **10 Claims**



1. In combination:

a plurality of RF power input terminals,

an electrically conductive housing arranged to form an ionization chamber when coupled to a source of reference potential,

a first target holder electrode mounted in said chamber electrically insulated from said housing,

a second target holder electrode mounted in said chamber spaced from said first target holder electrode and electrically insulated from said housing,

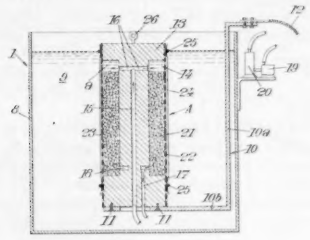
first and second RF power connecting means each coupled between a separate, different one of said electrodes and a corresponding, separate, different one of said RF power input terminals, said first connecting means and said chamber exhibiting first and third impedances between the corresponding one electrode and said housing, said second connecting means and said chamber exhibiting second and fourth impedances different from said first and third impedances between the corresponding other electrode and said housing, and

impedance balancing means coupled across one of said first and second impedances for balancing the impedances between said electrodes and said housing.

3,860,508
INSTALLATIONS FOR FORMING AN ELECTROLYTIC COATING

Michel Durin, Paris, France, assignor to Societe Anonyme Automobiles Cirtoen, Paris, France

Filed Nov. 7, 1972, Ser. No. 304,569
Claims priority, application France, Nov. 9, 1971, 71.40152
Int. Cl. B65g *49/00*
U.S. Cl. 204—198 **13 Claims**



1. Installation for forming an electrolytic coating on the walls of members exposed to frictional forces, especially on the trochoidal inner walls of rotary piston engine casings, said installation comprising:

a tank arranged to contain a bath of electrolyte including solid particles of small size,

an anode and a cathode,

means for stacking several identical members, enabling the cathode of the installation to be constituted by a stack of members,

means for introducing the stack into the bath of the tank and for withdrawing said stack,

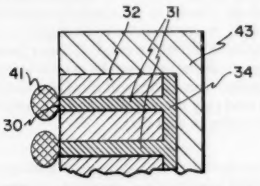
the anode comprising a compartment in which are arranged blocks of a metal to be deposited on the members,

means for maintaining the anode in said tank when the cathode is withdrawn and, surrounding the anode, a bag of very fine mesh adapted to retard the entry, into the anode compartment, of said solid particles from the electrolytic bath, and means for feeding anolyte directly to the anodic compartment, and independently from the electrolytic bath of the tank.

3,860,509
CONTINUOUS ELECTROWINNING CELL

Robert Clarence Emmett, Jr., Dundee, Ill., assignor to Envirotech Corporation, Salt Lake City, Utah

Filed Feb. 20, 1973, Ser. No. 334,157
Int. Cl. B01k *1/00*; C22d *5/00*; B23p *1/00*
U.S. Cl. 204—281 **12 Claims**

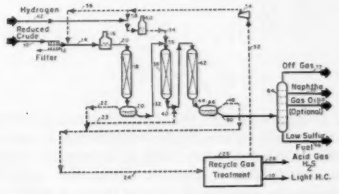


1. Apparatus for electrowinning of metal from a metal bearing electrolyte solution comprising a tank having an inlet and outlet and adapted to contain a substantially constant volume of electrolyte in continuous flow therethrough, an anode and a cathode mounted in said tank with conductive surfaces in functional relationship to each other, and said conductive surface of said cathode comprising a smooth surface formed from the free ends of a plurality of relatively small electrical conductors each of cross-sectional area in the range from 0.0005mm² to 0.018mm² and a matrix of non-conductive material holding said small conductors spaced-apart a distance of at least 0.25mm.

3,860,510
COMBINATION RESIDUE HYDRODESULFURIZATION AND ZEOLITE RISER CRACKING PROCESS

Alfred M. Henke, Springdale, and Joel D. McKinney, Pittsburgh, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Aug. 22, 1973, Ser. No. 390,359
Int. Cl. C10g *37/00*
U.S. Cl. 208—61 **9 Claims**



1. A process for producing gasoline from a feed residual petroleum oil containing asphaltenes, metals and sulfur without a distillation or a solvent extraction step for removal of asphaltenes comprising pretreating said feed oil in a plurality of hydrodesulfurization stages in series including an initial stage and a final stage each operating at a hydrogen pressure above 1,000 psi and at a temperature between about 650° and 800°F., each stage employing a catalyst comprising Group VI and Group VIII metals on alumina, the catalyst in said final stage comprising a higher weight percent of Group VI and Group VIII metals than the catalyst in said initial stage, increasing the temperature in each stage with increasing catalyst age to compensate for catalyst activity aging loss, maintaining a lower hydrogen pressure in said final stage than in said initial stage, removing asphaltenes, metals and sulfur from the feed oil in said initial and said final stages with a greater amount of metals and sulfur being removed from the feed oil in said initial stage than in said final stage, said pretreatment producing a substantially asphaltene-free hydrodesulfurized effluent comprising more than 80 volume percent yield boiling above the gasoline range based on feed, and converting at least a portion of said asphaltene-free effluent to gasoline in a zeolite riser cracker.

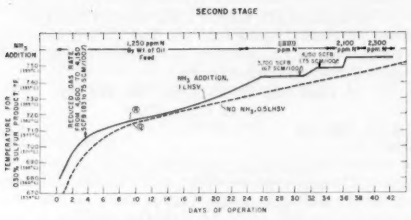
3,860,511
TWO-STAGE RESIDUAL OIL HYDRODESULFURICATION PROCESS WITH AMMONIA ADDITION

Louis W. Brunn; James A. Frayer, and John A. Paraskos, all of Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jan. 22, 1974, Ser. No. 434,582
Int. Cl. C10g *23/02*
U.S. Cl. 208—210 **11 Claims**

1. A process for the hydrodesulfurization of an asphaltene-containing oil at a reaction temperature in the range of 600° to 900°F. wherein said oil is passed in the presence of a sulfided catalyst containing Group VI and Group VIII metals on alumina in a first stage to reduce the sulfur content to a first level, removing the reaction effluent from said first stage, flashing said effluent to remove hydrogen containing contaminant gases, passing the flashed effluent from said flashing step and added hydrogen to a second hydrodesulfurization stage to reduce said sulfur content to a second level in the presence of

a sulfided catalyst containing Group VI and Group VIII metals on alumina, adding ammonia to said catalyst in said second stage in an amount to increase hydrodesulfurization in said process as compared to the absence of said ammonia, the ammonia concentration in the reaction gases being lower than



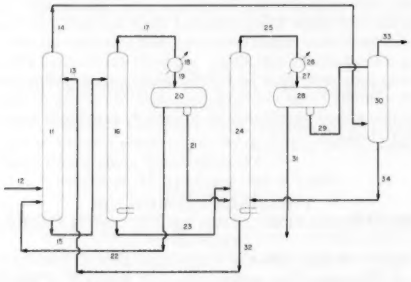
the average hydrogen sulfide concentration in said gases, and incrementally increasing the temperature in said second stage within said temperature range to compensate for loss of catalyst activity due to catalyst aging, said ammonia addition reducing the quantity of catalyst required in said second stage to achieve said second sulfur level.

3,860,512

SOLVENT EXTRACTION OF AROMATIC HYDROCARBONS WITH 1,2,3-TRIS-(2-CYANOETHOXY)-PROPANE

Paul E. Eberly, Jr., Baton Rouge, La., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Jan. 10, 1974, Ser. No. 432,347
Int. Cl. C10g *21/20*
U.S. Cl. 208—330 **5 Claims**



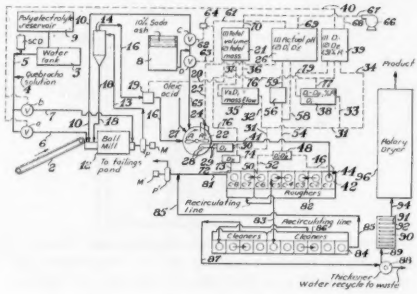
1. A process for the separation of aromatic hydrocarbon compounds from mixtures of hydrocarbon compounds containing both aromatic and non-aromatic compounds, which comprises contacting in an extraction zone a mixture of aromatic and non-aromatic hydrocarbon compounds with 1,2,3-tris-(2-cyanoethoxy)-propane to dissolve selectively the aromatics therein and form an extract phase comprising 1,2,3-tris-(2-cyanoethoxy)-propane and the aromatics and separating said extract phase from undissolved non-aromatics compounds.

3,860,513

METHOD OF RECOVERING MINERAL VALUES FROM ORE

Porter Hart, 52 Lake Rd., and Asa Elliott Hatch, 118 Post Oak, both of Lake Jackson, Tex. 77566

Filed Jan. 20, 1972, Ser. No. 219,226
Int. Cl. B03b *1/04;* **B03d** *1/02*
U.S. Cl. 209—1 **6 Claims**



1. In a flotation process for the recovery of mineral values from a slurry of finely ground ore in water by employing in the slurry an electrode potential-modifying agent, a flotation aid and a suppressant, and passing upwardly therethrough a gaseous foaming agent to produce a collectable foam at or near the surface, containing desirable minerals to be recovered, the improvement characterized by determining the ionic charge density of the water prior to mixture with said ore, the slurry or both and adjusting said charge density by the addition of an organic polymeric cationic polyelectrolyte to the water, slurry or both in amount necessary to provide a predetermined optimum ionic charge density to effectuate a more efficient recovery of mineral values.

3,860,514

METHOD OF BENEFICIATING ALUMINA-SILICA ORES

Thomas E. Lee, and Frederick W. Frey, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 74,169, Sept. 21, 1970, abandoned. This application Nov. 24, 1972, Ser. No. 309,490
Int. Cl. B03c *1/00*
U.S. Cl. 209—8 **5 Claims**

1. A method of beneficiating aluminous clay containing iron oxides to effectively lower the content of said iron oxides in said clay comprising the steps of: crushing or grinding said clay to a convenient particle size of about one-quarter inch to about one-half inch in diameter, oxidatively roasting said crushed or ground clay in a flowing oxidative medium at a temperature of about 1,300°C to about 1,400°C for a period of at least about 2 hours to substantially agglomerate the iron oxides, crushing or grinding the roasted clay to a particle size of about −40 mesh to +400 mesh U.S. Sieve Series, and subsequently magnetically separating the magnetic iron oxides from the non-magnetic iron oxides and removing said magnetic iron oxides from said clay thereby effectively lowering the content of said iron oxides in said clay.

3,860,515

METHOD FOR CONCENTRATING MACROMOLECULES

Norman G. Anderson, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Oct. 31, 1973, Ser. No. 411,504
Int. Cl. B01d *13/00*
U.S. Cl. 210—22 **5 Claims**

1. A process for concentrating macromolecules, comprising the steps of:

enclosing a prime liquid containing said macromolecules as a solute or suspension within a dialysis membrane;
immersing said membrane within a bath of the solvent or suspending medium of said prime liquid;
freezing said bath; and
removing said membrane containing concentrated macromolecules from the frozen bath.

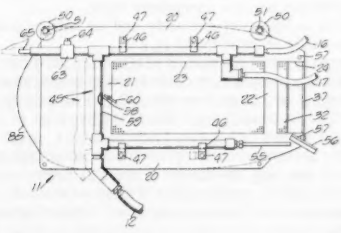
3,860,516
SLIME CONTROL COMPOSITIONS AND THEIR USE
Bernard F. Shema, Glenside; Robert H. Brink, Jr., Doylestown, and Paul Swered, Philadelphia, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.
Filed June 14, 1973, Ser. No. 370,086
Int. Cl. A01h *9/02*; **C02b** *3/06*
U.S. Cl. 210—62 **8 Claims**

3. A method for controlling the growth of the microorganism *Aerobacter aerogenes* in an aqueous system which comprises adding to said system an effective amount of a composition comprised of N-2-nitrobutyl morpholine and 2,4,5 - trichlorophenol, wherein the weight ratio of the morpholine to the phenol ranges from about 5:95 to about 95:5 respectively.

3,860,517
SLIME CONTROL COMPOSITIONS AND THEIR USE
Bernard F. Shema, Glenside, and Robert H. Brink, Jr., Doylestown, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.
Filed June 15, 1973, Ser. No. 370,484
Int. Cl. A01n *9/02*; **C02b** *3/06*
U.S. Cl. 210—62 **8 Claims**

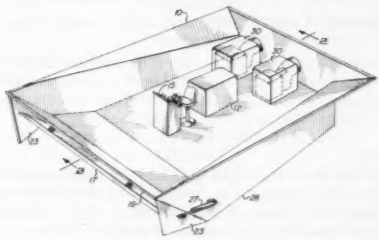
3. A method for controlling the growth of the microorganism *Aerobacter aerogenes* in an aqueous system which comprises adding to said system an effective amount of a composition comprised of N-2-nitrobutyl morpholine and pentachlorophenol wherein the weight ratio of the morpholine to the phenol ranges from about 5:95 to about 95:5 respectively.

3,860,518
APPARATUS AND METHOD FOR CLEANING SWIMMING POOLS
Evan R. Henricksen, 817 E. Othello St., Arcadia, Calif. 91006
Continuation-in-part of Ser. No. 173,497, Aug. 27, 1971, abandoned. This application Dec. 4, 1972, Ser. No. 312,053
Int. Cl. B01d *37/00*
U.S. Cl. 210—65 **38 Claims**



1. A jet-propelled meandering swimming pool skimmer comprising: buoyant means including a perforated debris collecting receptacle having a forwardly facing wide shallow water and debris inlet having its lower edge submerged when said skimmer is buoyantly supported in a swimming pool, and means, including at least one flexible water whip, carried by said skimmer and adapted to be connected via a flexible hose to a stationary source of pressurized water for jetting a plurality of streams of pressurized water rearwardly and effective to propel said skimmer forwardly in a generally meandering path over the surface of a pool of water with said water and debris inlet facing forwardly in the direction of travel to collect floating debris entering said collecting receptacle through said water and debris inlet.

3,860,519
OIL SLICK SKIMMER
Danny J. Weatherford, 7250 N. 41st Ave., Phoenix, Ariz. 85021
Filed Jan. 5, 1973, Ser. No. 321,281
Int. Cl. E02b *15/04*
U.S. Cl. 210—242 **3 Claims**



1. A flat-bottomed barge having a bow and stern for removing oil slicks from a body of water comprising:
a first compartment extending the length and width of the barge,
a second compartment extending from and below said first compartment and forming a liquid receiving compartment therebetween,
said second compartment extending the length and width of the barge and isolated from said first compartment,
a sluice gate formed in said second compartment in the bow of the barge for selectively admitting surface water only into the receiving compartment,
means mounted on said barge for controlling the opening and closing of said sluice gate to vary the depth of surface water admitted into said receiving compartment, and
jet means for pumping out of said receiving compartment the water and oil mixture skimmed from said body of water,
each of said first and second compartments having a blunt bow,
said sluice gate comprising a panel hingedly mounted on the bottom of said second compartment for movement angularly thereto to selectively move from a closed gate position wherein the top of said panel is above the surface of the water to a position wherein the top of the gate is below the surface of the water,
and a a pair of flaps, one mounted on said barge at each side of said panel for forming a closed funnel with said panel extending into said receiving compartment, and
means for keeping said flaps in contact with the edges of said panel when said panel is moved to any of its various angular positions,
means connected to said pumping means for directing the skimmed water and oil into a container,
said container comprising a storage compartment, and
means for separating the oil from said stored skimmed water and returning the water to said body of water.

3,860,520
ODOR REDUCTION IN ALCOHOLS

Laurence D. Lindemuth, Morris, Ill.; Donald K. Whitehead, Lake Charles, and Chester Fronczek, Westlake, both of La., assignors to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 662,196, Aug. 22, 1967, , which is a continuation of Ser. No. 435,049, Feb. 24, 1965, abandoned. This application Aug. 19, 1968, Ser. No. 753,767
Int. Cl. C07c *29/24*
U.S. Cl. 260—643 F 10 Claims

1. In a process for removing an alkanediol odor precursor from a mixture comprising an alkanediol odor precursor and an alkanol having 12 to 30 carbon atoms per molecule, said alkanediol odor precursor being an alkanediol which produces an odoriferous material upon sulfation; the improvement comprising:

a. contacting said mixture with an alkaline borohydride for a period of at least 1 hour at a temperature in the range of 500°F to the lowest decomposition temperature of the alkanol to form a borohydride-alkanediol complex,

b. selectively volatilizing the alkanol from the borohydride-alkanediol complex, and

c. recovering the alkanol.

3,860,521
SOAP BASED CHAIN CONVEYOR LUBRICANT

Otto T. Aepli, Southgate; Malachy E. Sorgenfrei, Trenton, and Harold L. Conaway, Wyandotte, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Mar. 20, 1972, Ser. No. 236,349
Int. Cl. C10m *3/40, 3/18, 3/04*
U.S. Cl. 252—34.7 6 Claims

1. In an aqueous lubricating composition concentrate for lubricating continuously moving conveyor systems wherein said concentrate consists essentially of by weight of about 30 to about 70 percent water, about 2 to 15 percent sequestering agent, about 2 to 30 percent anionic surface active agent, about 4 to 20 percent fatty acid soap selected from the group consisting of fatty acid alkali metal soap, fatty acid alkanol amine soap and fatty acid ammonia soap, zero to 20 percent coupling agent selected from the group consisting of propylene glycol, isopropyl alcohol and ethylene glycol, and about 2 to 10 percent nonionic surface active agent, the improvement comprising adding monostearyl acid phosphate to said concentrate in an amount from about 0.15 to about 1.75 weight percent of said concentrate whereby improved defoaming properties are obtained.

3,860,522
SYNTHETIC LUBRICANTS RESISTANT TO SHEAR AND COLD

Diether Fischer, 7 Im Sandgarter, Wachenheim; Paul Hornberger, 12 In den Ziegelgaerten, and Willy Wolf, 8 Alwin-Mitlasch-Platz,, both of Ludwigshafen, all of Germany

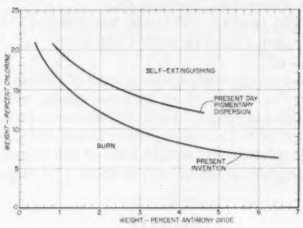
Filed Apr. 6, 1971, Ser. No. 131,796
Claims priority, application Germany, Apr. 14, 1970, 2017744
Int. Cl. C10m *1/28*
U.S. Cl. 252—56 S 4 Claims

1. Shear-resistant and cold-resistant synthetic lubricants consisting essentially of a mixture of esters of branched-chain dicarboxylic acids of from **16** to **22** carbon atoms and aliphatic alcohols of less than **6** carbon atoms with homopolymers of butenes having a molecular weight of **2,500** to **4,000**, said esters being **45** to **80%** by weight of said mixture and said homopolymers being **55** to **20%** by weight of said mixture.

3,860,523
ANTIMONY OXIDE COLLOIDAL SOL, FORMULATION AND METHOD OF PREPARING THE SAME

Henry G. Petrow, 33 Concord Ave., Cambridge, Mass. 02138, and Robert J. Allen, 130 Adams Ave., Saugus, Mass. 01906

Filed Dec. 27, 1971, Ser. No. 212,375
Int. Cl. C09k *3/28*
U.S. Cl. 252—8.1 3 Claims



1. A process for forming colloidal Sb_2O_5, that comprises, reacting Sb_2O_3 with KOH and H_2O_2 in the ratios of substantially 1 mole to 2.1 moles to form potassium antimonate, and deionizing the potassium antimonate, the pH being adjusted to the range of from substantially 1.5 to 10.

3,860,524
HIGH PERMEABILITY MANGANESE-ZINC FERRITES

Alex Goldman, Butler, Pa., assignor to Spang Industries, Inc., Butler, Pa.

Continuation of Ser. No. 888,912, Dec. 29, 1969, abandoned. This application June 2, 1972, Ser. No. 259,032
Int. Cl. C04b *35/38*
U.S. Cl. 252—62.62 8 Claims

1. Method of manufacturing miniature sized manganese-zinc ferrite cores having a permeability in the range of 5,000 to 10,000 and loss factor (1/MuQ) of about 10×10^{-6} at 100 KHz comprising

mixing pulverant oxides of manganese, zinc, and iron in predetermined proportions in the range of

24 to 30 mol per cent manganese oxide,

18 to 24 mol per cent zinc oxide, and the balance consisting essentially of ferric oxide,

compressing at least a portion of the mixed pulverant oxides to form a toroidal core of desired size having an external diameter in a range from about 0.10 inch to a maximum of 0.25 inch and a core height in the range of 0.05 to 0.150 inch

directly plunging such compressed core into a high temperature sintering environment having a temperature between 1200°C. and about 1450°C. to substantially instantaneously raise the compressed core to sintering temperature,

sintering the compressed product in a high temperature gaseous atmosphere at about 1200°C. to about 1450°C. for about 30 minutes, the high temperature gaseous atmosphere exerting a partial pressure of about two-tenths atmosphere oxygen, with the balance being substantially inert, then

controllably cooling the sintered core at a rate between about 5°C. and 15°C. per minute in a substantially inert atmosphere to a temperature about 1000°C., and then

continuing cooling in a substantially inert atmosphere to about 200°C.

3,860,525
CLEANING COMPOSITION WITH STABILIZED PERFUME

Charles L. Bechtold, Edison, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 133,339, April 12, 1971, abandoned. This application Feb. 26, 1973, Ser. No. 335,460
Int. Cl. C11d *7/54*
U.S. Cl. 252—99 **7 Claims**

1. A stable, perfumed, alkaline detergent composition consisting essentially of from 0.05 to 1.0% by weight of citrus fragrance selected from the group consisting of argeol, benzyl acetate, citral, citronellal, citronellol, fleur delys, geraniol, heliotropine, linalool, peppermint oil, sandalwood oil, terpinyl acetate, glycidon, rhodinol, bergamot compound, lavindin abrial replacement compound, olibanum compound, and the composition consisting of mono-terpene hydrocarbons, cineole, fenchol, alpha-terpineol, cinnamaldehyde and coumarin, from about 40–95% by weight of water soluble organic and/or inorganic builder salts sufficient to yield a pH in water of from 9.5 to 12, from about 0.5 to 5% by weight of water soluble organic anionic and nonionic detergent and from 1 to 15% by weight of boron compound selected from the group consisting of boric oxide, boric acid and mixtures thereof.

3,860,526
SOLID BLOCK FLOCCULENT WITH CONTROLLED RELEASE RATE

Dennis Thomas Corbett, Chesterfield, England, assignor to Hemlab A.G., Chur, Switzerland

Filed July 27, 1972, Ser. No. 275,842
Int. Cl. B01d *21/02*; **C02b** *1/20*
U.S. Cl. 252—181 **19 Claims**

1. A solid composition which releases a flocculent at a controlled rate upon immersion in an aqueous medium to be treated which consists essentially of:

a. 0.1 to 60% by weight of a polymeric flocculent having a molecular weight of from 100,000 to 30 million;

b. 0.5% to 94.9% by weight of the sodium, potassium or ammonium salt of carbonic acid, sulphuric acid, silicic acid, benzoic acid, citric acid, phosphoric acid or boric acid as the fixing agent;

provided that when the flocculent is a medium hydrolyzed polyacrylamide, the fixing agent is said salt or sodium tetraborate in combination with said carbonate salt; and

c. 5% to 80% by weight of water.

3,860,527
PROCESS FOR THE SIMULTANEOUS PREPARATION OF METAL SALTS OF AN ALKYL ESTER OF A SULFOALKOXYCARBOXYLIC ACID AND A SULFOALKOXYALKANOL

Sager Tryon, Claymont, Del., assignor to FMC Corporation, Philadelphia, Pa.

Filed July 20, 1973, Ser. No. 380,983
Int. Cl. C07c *143/52*
U.S. Cl. 252—182 **6 Claims**

1. A method comprising reacting in a substantially anhydrous C_2-C_4 alkylene glycol an alkali-metal C_2-C_4 alkylene glycolate with a lower alkyl ester of a hydroxy substituted aromatic mono- or dicarboxylic acid or a lower alkyl ester of a hydroxy substituted aliphatic mono- or dicarboxylic acid having a dissociation constant in water of 6×10^{-14} or greater to form an alkali-metal salt of said lower alkyl ester and then reacting this salt and the remaining alkali-metal glycolate with a C_3-C_4 alkane sultone in the same reaction medium to form both the alkali-metal salt of the lower alkyl ester of a sulfoalkoxy aromatic or aliphatic carboxylic acid and the alkali metal salt of a sulfoalkoxy alkanol.

3,860,528
CHEMICAL COMPOSITION CONTAINING MIXED OLEFINS

William J. Dewitt, and Melvin E. Tuvell, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 45,151, June 10, 1970, abandoned. This application Aug. 7, 1972, Ser. No. 278,553
Int. Cl. C07c *11/00*
U.S. Cl. 252—182 **7 Claims**

1. A composition of matter consisting essentially of monoolefins having from about 12 to about 16 carbon atoms per molecule and averaging from about 14.1 to about 15.9 carbon atoms per molecule wherein the weight ratio of C_{14} olefins to C_{16} olefins is from about 5.7/1 to about 1/2, said olefins consisting essentially of from about 60 to about 90 mol percent vinyl olefins, from about 3 to about 30 mol percent vinylidene olefins and from about 3 to about 12 mol percent internal olefins.

3,860,529
STABILIZED TETRAGONAL ZIRCONIA FIBERS AND TEXTILES

Bernard H. Hamling, Warwick, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 700,031, Jan. 24, 1968, abandoned. This application May 1, 1972, Ser. No. 249,057
Int. Cl. C09k *3/00*
U.S. Cl. 252—301.1 R **4 Claims**

1. Fibrous zirconia containing an oxide of a metal of Group III B of the Periodic Table, said oxide being selected from the group consisting of scandia, lanthana, ceria and mixed rare earth oxides, said oxide being present in an amount of from about 5 to about 20 percent based upon weight of zirconia plus oxide to maintain at least about 80 percent of said fibrous zirconia in the tetragonal form when heated at about 800°C for about one hour.

3,860,530
DEPILATORY COMPOSITION FOR REMOVING FIBERS FROM ANIMAL SKINS

James Henry Howe, Manly, New South Wales, Australia, assignor to Global Wool Investments Limited, Queen's Road Central, Hong Kong

Filed Mar. 21, 1973, Ser. No. 236,592
Claims priority, application Australia, Mar. 29, 1971, 27,064/71
Int. Cl. B01f *3/12*
U.S. Cl. 252—363.5 **3 Claims**

1. A depilatory composition for removing fibers from animal skins which consists essentially of a reaction product of from 47 to 70 percent by weight of one or more lower aliphatic carboxylic acids and/or the anhydrides thereof, from 12 to 35 percent by weight of a lower alkanolamine, and from 10 to 35 percent by weight of urea, said composition being substantially non-aqueous and having a pH within the range of 3.5 to 4.8 when in aqueous solution.

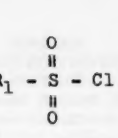
3,860,531
ALKYLATION AIDS

Edward L. Cole, Fishkill, and Frederic C. McCoy, Beacon, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed June 18, 1973, Ser. No. 371,008
Int. Cl. C07c *143/72*, *3/14*, *3/54*
U.S. Cl. 252—426 **9 Claims**

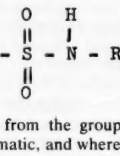
1. A process for manufacturing a liquid solution useful as an alkylation aid comprising:

a. combining, in a reaction zone, primary alkylamine having an alkyl radical of from about 8 to 30 carbon atoms, aqueous sodium hydroxide solution of from about 2 percent to about 10 percent sodium hydroxide concentration, and a sulfonyl chloride of the formula:



wherein R_1 is selected from the group consisting of alkyl, aromatic, and alkyl aromatic, in the presence of a hydrocarbon solvent boiling within the gasoline boiling range;

b. reacting the mixture of step (a), at a temperature of from about 35°C. to about 75°C., below the boiling point of the hydrocarbon solvent, to form a reaction mixture containing the reaction products water, sodium chloride and a sulfonamide of the formula



wherein R_1 is selected from the group consisting of alkyl, aromatic, and alkyl aromatic, and wherein R_2 is alkyl of from 8 to 30 carbon atoms;

c. separating the reaction mixture of step (b) into a water phase and a hydrocarbon phase substantially free of water, wherein the hydrocarbon phase comprises from about 5 parts to about 50 parts hydrocarbon solvent and one part sulfonamide reaction product;

d. dissolving, in a weight ratio of from about 1:1 to about 10:1 based on sulfonamide, an alkyl phenol solubilizing agent in said dry hydrocarbon phase to form a clear solution of alkyl phenol and sulfonamide in hydrocarbon solvent;

e. separating any solid sodium chloride from the solution of step (d) by solid-liquid separation means; and

f. recovering the clear solution of alkyl phenol and sulfonamide in hydrocarbon solvent for use as an alkylation aid in a strong acid catalyzed alkylation reaction.

3,860,532

METHOD FOR PREPARING SILICA-ALUMINA CATALYSTS FOR THE CONVERSION OF HYDROCARBON

Shinji Takase, Kawasaki, and Takahiko Yamazi, Yokohoma, both of Japan, assignors to Nippon Oil Company, Limited, Minato-ku, Tokyo, Japan

Filed June 5, 1972, Ser. No. 259,384

Claims priority, application Japan, June 8, 1971, 46-39829

Int. Cl. B01j *11/40*; **C01b** *33/20*

U.S. Cl. 252—453 **6 Claims**

1. Method for preparing silica-alumina catalysts for the conversion of hydrocarbons which comprises reacting an aluminum salt and a silicon salt in aqueous solution while maintaining the pH at about 10–14, said salts being water-soluble at said pH, adding an acid to adjust the pH of the solution to about 1 to 7, and raising the pH of the resulting acid solution to about 5–9 by addition of an alkali.

3,860,533

HYDROCRACKING CATALYST

Dean Arthur Young, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 209,440, Dec. 17, 1971, abandoned, Continuation-in-part of Ser. No. 869,389, Oct. 24, 1969, abandoned, which is a continuation-in-part of Ser. No. 669,288, Sept. 20, 1967, abandoned. This application Feb. 20, 1973, Ser. No. 333,848

Int. Cl. B01j *11/40, 11/06, 11/32*

U.S. Cl. 252—455 Z **9 Claims**

1. A hydrocarbon conversion catalyst comprising a crystalline aluminosilicate zeolite base intimately composited with at least about 5 weight-percent of a finely divided Group VIB metal hydrogenating component, said hydrogenating component or a precursor thereof having been composited with said zeolite base by comulling the two components with only sufficient water to yield a moist, extrudable mixture in which the aqueous phase has a pH below about 5, but sufficiently high to avoid acid destruction of the zeolite crystal structure, and thereafter extruding the mixture into shaped aggregates, and drying and calcining the resulting aggregates.

3,860,534

METHOD OF MAKING AN ANTIMONY-VANADIUM CATALYST

Norman Harris, Stockton-on-Tees; Frederick Joseph Flintoff, Tollesvy, and Robert Reid, Great Sankey, near Warrington, all of England, assignors to Power-Gas Limited, Teesside, England

Filed Mar. 13, 1972, Ser. No. 234,309

Claims priority, application Great Britain, Mar. 24, 1971, 2681/71; Dec. 17, 1971, 58745/71

Int. Cl. B01j *11/06*

U.S. Cl. 252—461 **12 Claims**

1. In a method of making a catalyst for the oxidation of alkanes and alkenes, said catalyst consisting essentially of the calcined oxides of vanadium and antimony, by a high temperature calcination at 700° to 900°c. of antimony and vanadium oxides or their compounds which are convertible by calcining to their oxides to provide a calcined mixture having an atomic ratio of vanadium to antimony of 0.05:1 to 1.5:1, wherein the improvement comprises washing the calcined mixture with water to provide an antimony and vanadium-containing catalyst suitable for the oxidation of alkanes and alkenes.

3,860,535

DUAL CROSS-FLOW CATALYST SYSTEM

James R. Johnson, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 4, 1973, Ser. No. 321,021

Int. Cl. B01j *11/22*

U.S. Cl. 252—472 **11 Claims**

1. An integral supported dual-catalyst system comprising:

I. A ceramic honeycomb catalyst support having a first multiplicity of passageways having a first specific direction and a second multiplicity of passageways having a second specific direction separated from said first multiplicity by thin common ceramic walls and,

II. A first catalyst coated on the walls of said first multiplicity of passageways and a second catalyst coated on the walls of said second multiplicity of passageways,

said first catalyst and said second catalyst not being mutually inactivating.

3,860,536

ENZYME-DETERGENT COMBINATION

Richard G. Landwerlen, Indianapolis, Ind., and Theodore H. Kritchevsky, Chicago, Ill., assignors to CPC International Inc., Inglewood Cliffs, N.J.

Continuation-in-part of Ser. No. 200,382, Jan. 2, 1970, abandoned. This application Jan. 18, 1971, Ser. No. 107,423

Int. Cl. C11d *1/14, 1/72, 7/42*

U.S. Cl. 252—551 **23 Claims**

1. A stable enzyme-detergent combination comprising an aqueous solution of (a) the equivalent of from about 0.001 percent to about 3.0 percent of a protease having an average activity of 165,000 PCA units per gram (b) from about 0.05 percent to about 40 percent of a detergent and (c) from about 5 to about 60 percent propylene glycol as a stabilizing agent, said aqueous solution having a pH within the range of from about 6.0 to about 9.5.

16. A stable enzyme-detergent combination consisting essentially of an aqueous solution of (a) the equivalent of from about 0.001% to about 3.0% of a protease derived from Bacillus subtilus having an average activity of 165,000 PCA units per gram (b) from about 0.05% to about 40% of a non-ionic detergent and (c) from about 5% to about 60% of propylene glycol, said aqueous solution having a pH within the range of from about 6.0 to about 9.5.

19. A stable enzyme-detergent combination consisting essentially of an aqueous solution (a) having the equivalent of from about 0.001% to about 3.0% of a protease derived from Bacillus subtilus and having an average activity of 165,000 PCA units per gram, (b) from about 0.05% to about 40% of an anionic detergent and (c) from about 5% to about 60% of propylene glycol, said aqueous solution having a pH of from about 6.0 to about 9.5.

3,860,537
PROCESS FOR PREPARING A FOAMED SHAPED ARTICLE

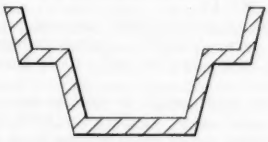
Neil Bonnette Graham; Richard George Cleveland Henbest, and Francis Gowland Hutchinson, all of Runcorn, Great Britain, assignors to Imperial Chemical Industries Limited, London, England

Filed Aug. 7, 1972, Ser. No. 278,345

Claims priority, application Great Britain, Aug. 18, 1971, 38739/71

Int. Cl. C08g *22/44*

U.S. Cl. 260—2.5 AN **16 Claims**



1. A foamed polymeric article of simple shape capable of being shaped to a more complex shape and capable of being cured in said more complex shape, said article being formed by foaming shaping and partially curing a mixture comprising

a. from 5% to 95% by weight of polyurethane precursors comprising at least one polyfunctional compound containing groups reactive with isocyanate groups and at least one polyisocyanate, and

b. from 95% to 5% by weight of polyester resin precursors comprising

i. at least one ethylenically unsaturated polyester containing at least two groups reactive with isocyanate groups, and

ii. at least one ethylenically unsaturated monomer copolymerizable with said ethylenically unsaturated polyester,

the extent of curing of the said precursors in said mixture being chosen such that in the mixture the polyfunctional compound and the ethylenically unsaturated polyester are substantially reacted with the polyisocyanate and the ethylenically unsaturated polyester and the ethylenically unsaturated monomer are substantially uncopolymerized.

3,860,538
PHOTODEGRADABLE POLYMER MASTERBATCHES

James Edwin Guillet, 31 Sagebrush Ln., Don Mills, Ontario, Canada, and Harvey Graham Troth, Liphook, England

Filed Apr. 9, 1973, Ser. No. 349,048

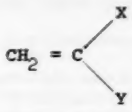
Claims priority, application Great Britain, Apr. 7, 1972, 16076/72; Canada, Sept. 11, 1972, 151353

Int. Cl. C08c *17/08*

U.S. Cl. 260—2.5 HA **15 Claims**

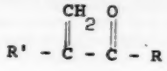
1. A polymeric composition photodegradable on exposure to ultraviolet radiation, said composition comprising:

a. a major proportion of an addition polymer or copolymer of one or more vinylidene monomers represented by the general formula

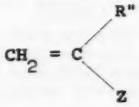


where X is selected from the groups hydrogen, lower alkyl and halogen, and Y is selected from the groups hydrogen, lower alkyl, aryl, substituted aryl, carboxylic acid, carboxylic acid lower alkyl ester, hydroxyl, lower acyloxy, halogen, cyano, alicyclic of not more that 8 carbon atoms, lower alkoxy, amido and lower alkenyl; and

b. a minor proportion of a ketone copolymer of at least one unsaturated ketone of the general formula



where R′ represents hydrogen or a lower alkyl group, and R represents an alkyl, alkaryl, alkenyl or aryl group, having from 1 to 9 carbon atoms, and at least one vinylidene monomer of the general formula



where R″ represents hydrogen, halogen or an alkyl group, and Z is a functional group selected from aryl, substituted aryl, carboxylic acid, lower alkyl carboxylate, lower alkyl, lower alkenyl, hydrogen, halogen, nitrile, lower acyloxy, lower alkoxy and amido;

the amount of keto carbonyl groups in the composition being from about 0.01 weight percent to about 5 weight percent, based upon the total weight of addition polymer and ketone copolymer in the composition.

3,860,539
LINING AGENT FOR A TUBELESS PNEUMATIC TIRE

Teruhiko Miyazato, 18-7, Shiomi-cho, Sasebo, Japan

Continuation-in-part of Ser. No. 158,562, June 30, 1971, abandoned, which is a continuation of Ser. No. 757,433, Sept. 4, 1968, abandoned. This application July 14, 1972, Ser. No. 271,686

Claims priority, application Japan, Sept. 13, 1967, 42-77828

Int. Cl. B60c *21/08*

U.S. Cl. 260—4 R **12 Claims**

1. A tire lining agent capable of rendering a vehicle tire puncture proof when placed in the interior of said vehicle tire, said tire lining agent being an aqueous dispersion which comprises:

a. an adhesive consisting essentially of an aqueous emulsion

of polyvinyl acetate, polyacrylic acid ester, butadiene-acrylonitrile rubber, polychloroprene or polychloroprene copolymer, said aqueous emulsion being

i. dispersible in water; and

ii. adhesive to finely divided particulate solid rubber particles,

100 parts of said aqueous emulsion being present per 18 to 54 parts of water; and

b. finely divided particulate solid rubber particles intimately dispersed in said aqueous dispersion, said finely divided particulate solid rubber particles having a particle size of from about 50 to 1200

microns and being present in an amount sufficient to

seal a small puncture hole is said vehicle tire, said finely divided particulate solid rubber particles (b) having been derived from rubber in its dry state which, upon addition to said aqueous emulsion, remains in a state characteristic of its dry state whereby said finely divided particulate solid rubber particles (b) are capable of rendering a vehicle tire puncture proof when placed in the interior of said vehicle tire, said finely divided particulate solid rubber particles (b) being uniformly dispersed in said adhesive (a) through the incorporation in said tire lining agent of an effective amount of an anionic or nonionic surface active agent, said effective amount being sufficient to effect the uniform dispersion of said finely divided particulate rubber particles in said aqueous dispersion.

3,860,540

AGENT FOR RENDERING WOOL NON-FELTING

Heinz Abel, Reinach; Hans Hostettler, Basel; Alfred Berger, Reinach/Bl.; Rosemarie Toepfl, Basel, and Arthur Maeder, Therwill, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed May 17, 1972, Ser. No. 254,166

Claims priority, application Switzerland, May 26, 1971, 7768/71; Sept. 6, 1971, 13100/71

Int. Cl. 260 *32.4*; **C08g** *30/10*; **D06m** *15/42*

U.S. Cl. 260—18 EP **10 Claims**

1. An agent for rendering wool non-felting, said agent being water soluble or water dispersible and containing

1. a reaction product of a) an epoxide which contains at least two epoxide groups per molecule with

b. a fatty amine of 12 to 22 carbon atoms and c_1) a dicarboxylic acid of 7 to 14 carbon atoms wherein the epoxide-amine-carboxyl group ratios are 1:(0.1–0.5):(1–0.55) and the reaction temperature is 80° to 120°C; and

2) an adduct of a fatty amine of 12 to 22 carbon atoms with 6 to 30 moles of ethylene oxide, esterified with a dibasic or tribasic oxygen-containing acid.

3,860,541

STORAGE-STABLE, RAPIDLY CURABLE EPOXIDE RESIN COMPOSITION

Hans Lehmann, Birsfelden; Peter Wehrli, Mohlin, and Bruno Schreiber, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 21, 1972, Ser. No. 317,466

Claims priority, application Switzerland, Dec. 24, 1971, 18912/71

Int. Cl. C08g *45/12*, *45/14*, *47/100*

U.S. Cl. 260—18 PN **32 Claims**

1. A storage-stable, solid epoxide resin composition consisting essentially of:

a. a cyclic polyglcidyl compound with a softening point of between 40° and 140°C;

b. an adduct, possessing free amino groups having a softening point above 60°C, wherein said adduct is prepared by reacting a 1,2-epoxide resin with an excess of an aromatic or cycloaliphatic amine selected from the group consisting of a 4,4′-diaminodiphenylalkane and a 4,4′-diaminodicyclohexylalkane at a temperature of 80° to 200°C; and

c. a liquid polyamine selected from the group consisting of triethylenetetramine and a polyaminoamide of dimerized fatty acids,

wherein components (b) and (c) are present in a weight ratio of about 100 to 5.50 and the ratio of components (a) to (b) and (c) is such that the number of epoxide groups to the number of active hydrogen atoms is 1 to 1.

3,860,542

PROPYLENE RESIN COMPOSITION

Fumio Sakaguchi; Kenji Takemura, and Yukio Oda, all of Kanagawa, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1973, Ser. No. 345,609

Claims priority, application Japan, Mar. 31, 1972, 47-31757

Int. Cl. C08f *19/14*, *21/04*

U.S. Cl. 260—23 H **30 Claims**

1. A resin composition comprising:

5 to 60 parts by weight of a propylene polymer; and

95 to 40 parts by weight of alumina trihydrate having a gibbsite crystal structure and containing at least 0.20 percent by weight of fixed sodium compounds represented as Na_2O.

3,860,543

HOT-MELT COMPOSITIONS

Koichiro Masuda, Yamaguchi, and Katsuhiko Tasaka, Tokyo, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed June 25, 1973, Ser. No. 373,224

Int. Cl. C08f *45/52*

U.S. Cl. 260—28.5 AV **25 Claims**

16. Hot-melt compositions which comprise:

1. 20–60% by weight of (C) a petroleum resin having a 60°–130°C softening point and a 10–50 bromine value; and

2. 20–60% by weight of (D) an ethylene-vinyl acetate copolymer (melt index: 2.5–200) containing 15–40% by weight of vinyl acetate and/or an amorphous polypropylene; and

3. 10–50% by weight of a wax, said petroleum resin being produced by polymerizing, in the presence of a Friedel-Crafts catalyst, a mixed raw oil obtained by mixing a low boiling C_4–C_5 hydrocarbon fraction (A) having a boiling point of −15° to 45°C and comprising a major proportion by weight of C_4 and C_5 unsaturated hydrocarbons produced at the cracking or reforming of petroleum and a hydrocarbon fraction (B) having a boiling point range in the range of 145°–280°C, a bromine value of 60 to 90 and containing 30 to 60% by weight of vinyl aromatic hydrocarbons having 8 to 11 carbon atoms produced at cracking or reforming of petroleum, in a ratio by weight of A/E = 5/100–80/100.

3,860,544

HIGH OPACITY RESIN COATINGS OF EMULSION POLYMERS

Robert W. Kreider, St. Charles, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Apr. 18, 1972, Ser. No. 245,266

Int. Cl. C08f *45/28*

U.S. Cl. 260—29.6 T **9 Claims**

1. An aqueous latex coating composition adapted to deposit a film of low opacity resin which dries to produce a film of high opacity, consisting essentially of an aqueous continuous phase having stably suspended therein polymer particles of low opacity organic solvent-soluble resin consisting essentially of emulsion polymers or emulsion copolymers having a glass transition temperature below 25°C., said polymer particles having absorbed therein an aliphatic organic solvent which is immiscible in the aqueous phase of said latex, said aliphatic

solvent being present in an amount of from about 1 to about 35 parts per 100 parts by weight of polymer and being a volatile aliphatic hydrocarbon, there being no perceptible aliphatic solvent remaining in the aqueous phase of said latex, and at least 5 parts per 100 parts by weight of polymer of a secondary water-miscible organic solvent in said aqueous phase, said secondary organic solvent having a low capacity for solvating said polymer and a lower evaporation rate than said aliphatic solvent and being a volatile glycol, whereby, when said latex is deposited and dried, said solvents will evaporate to produce a relatively opaque film.

3,860,545

THERMOPLASTIC FILM FORMING COMPOSITION CONTAINING TITANIUM DIOXIDE MICROVOIDS

Daniel F. Herman, 39 Hemlock Cir., Princeton, N.J. 08540, and Dominic Simone, 22 Greentree Ter., Lincroft, N.J. 07738

Division of Ser. No. 212,657, Dec. 27, 1971,. This application Nov. 5, 1973, Ser. No. 412,556

Int. Cl. C09d *3/84*; **C08f** *19/10, 7/04, 3/68*

U.S. Cl. 260—29.6 RB **6 Claims**

1. A film forming and drying composition of matter consisting essentially of an emulsion of a thermoplastic polymeric resin, a solvent for said resin, said resin disolved in said solvent, an emulsifying agent and microdroplets of water suspended in said emulsion and TiO_2 pigment particles, said microdroplets of water containing said TiO_2 particles, said resin selected from the group consisting of polymethyl methacrylate, polystyrene and copolymers thereof, said solvent having a boiling point lower than the boiling point of water and said solvent being inert and insoluble in water to the extent of forming a separate phase in the water, said emulsifying agent being a solid graft polymer of ethyl acrylate on polyethylene oxide, said composition containing from 5% to 15% polymeric resin, and for each part of polymeric resin there are from 2 to 20 parts of solvent, from 1 to 6 parts of water, from 0.1 to 0.2 parts emulsifier and from 0.1 to 0.5 parts TiO_2, and said microdroplets of water being of of size from 0.1μ to 1.0μ in diameter; all said parts expressed by weight.

3,860,546

ELECTROCOATING BATH OF CARBOXYLIC RESIN FROM TRIMELLITIC ANHYDRIDE AND POLYURETHANE POLYOL

Ivan H. Tsou, Bloomfield Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 316,321, Dec. 29, 1972, , which is a division of Ser. No. 75,748, Sept. 25, 1970, Pat. No. 3,709,846, which is a continuation-in-part of Ser. No. 733,814, April 25, 1968, abandoned, which is a continuation-in-part of Ser. Nos. 363,814, April 30, 1964, abandoned, and Ser. No. 734,825, April 24, 1968, abandoned, which is a continuation-in-part of Ser. No. 363,815, April 30, 1964, abandoned. This application Mar. 4, 1974, Ser. No. 448,162

Int. Cl. B01k *5/02*; **C08g** *51/24, 22/16*

U.S. Cl. 260—29.2 TN **1 Claim**

1. In a bath composition for electrodepositing paint upon an anode and comprising on a pigment and particulate filler-free basis an aqueous dispersion of a film-forming, polycarboxylic acid, paint binder resin at least partially neutralized with a water-soluble base, the improvement wherein said polycarboxylic acid, paint binder resin is formed by:

A. reacting 2 molar parts of an organic diisocyanate with 1 molar part of a C_4 - C_8 diol consisting essentially of carbon, hydrogen and oxygen at a temperature in the range of about 20°C to 75°C,

B. reacting the product of (A) with 2 molar parts of a polyhydric alcohol selected from the group consisting of C_4 - C_8 diols consisting essentially of carbon, hydrogen and oxygen and C_3 - C_7 triols consisting essentially of carbon, hydrogen and oxygen at a temperature in the range of about 20°C to about 75°C, and

C. reacting the product of (B) with about 0.5 to about 2 molar parts of trimellitic anhydride at a temperature in the range of about 165° to about 168°C.

3,860,547

PRINTING FLUID

Robert W. Faessinger, Media, and Guido G. Roccheggiani, Chester, both of Pa., assignors to Scott Paper Company, Philadelphia, Pa.

Continuation of Ser. No. 424,226, Jan. 8, 1965, abandoned. This application Sept. 27, 1967, Ser. No. 671,546

Int. Cl. C08g *51/24, 51/66*

U.S. Cl. 260—29.4 R **9 Claims**

1. A low-viscosity printing fluid for printing cellulose webs which comprises an aqueous solution of (1) a water-soluble, cationic resin prepared by reacting (a) an aminotriazine and (b) formaldehyde and (2) a water-soluble dye compatible with said resin, said dye and resin mixture having a stability of from about 1 hour to in excess of 4 months, a transference value of from about 0 to about 4, and a viscosity of less than 20 cps. at 77°F.

3,860,548

PRINTING FLUID

Guido G. Roccheggiani, Chester, and Robert W. Faessinger, Media, both of Pa., assignors to Scott Paper Company, Philadelphia, Pa.

Continuation of Ser. No. 424,220, Jan. 8, 1965, abandoned. This application Sept. 28, 1967, Ser. No. 671,490

Int. Cl. C08g *51/24, 51/66*

U.S. Cl. 260—29.4 R **9 Claims**

1. A low-viscosity printing fluid suitable for printing cellulose webs which comprises an aqueous solution of a watersoluble, cationic, thermosetting, polyhydroxypolyalkylenepolyurea-formaldehyde resin condensate and a water-soluble dye compatible with said resin, said dye and resin mixture having a stability of from about 1 hour to in excess of 4 months and a transference value of from about 0 to about 4, and a viscosity of less than 20 cps at 77°F.

3,860,549

THERMOSETTING COATING COMPOSITIONS COMPRISING METHYLOLATED AMIDE INTERPOLYMERS OF HIGH ACID CONTENT IN COMBINATION WITH LOW MOLECULAR WEIGHT POLYHYDRIC ALCOHOLS

Kazys Sekmakas, Chicago, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 204,721, Dec. 3, 1971, abandoned. This application July 30, 1973, Ser. No. 383,716

Int. Cl. C08f *45/34, 45/24*

U.S. Cl. 260—29.6 TA **16 Claims**

1. A thermosetting solution coating composition comprising non-gelled solution interpolymer of monethylenically unsaturated monomers consisting essentially of from 7–20% by weight of the interpolymer of methylolated acrylamide, monethylenic carboxylic acid in an amount to provide in the interpolymer a ratio of carboxyl to N-methylol functionality of from .5:1 to .9:1, at least 50% by weight of the interpolymer from the group of styrene, vinyl toluene and methyl methacrylate, and from 3–20% by weight of the interpolymer of an ester of an alkanol containing from 4–24 carbon atoms with a monoethylenic carboxylic acid, and an aliphatic polyhydric alcohol having a molecular weight of up to about 6,000 and an hydroxy functionality of from about 2 to about 4 as the sole functionality thereof in an amount to provide a ratio of hydroxy to N-methylol functionality of from .06:1 to .6:1, said coating composition being adapted to deposit coatings which cure on baking to provide a flexible film having a pencil hardness of 2H or harder.

3,860,550
PRIMER COATING COMPOSITION

Abe I. Falkowitz, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 26, 1971, Ser. No. 147,190
Int. Cl. C08f *45/28*
U.S. Cl. 260—33.6 UA **5 Claims**

1. A one package primer coating composition comprising:
a. 300 parts by weight of a corrosion inhibiting pigment selected from a group consisting of zinc chromate and strontium chromate;
b. 300 parts by weight of a magnesium silicous extender selected from a group consisting of natural fibrous magnesium silicate and porous silica-magnesium oxide having a Hegeman fineness of 6½ to 7 and a loose bulk density of 9.63 pounds per cubic foot;
c. 1,050 parts by weight of a copolymer of 50 percent methyl methacrylate and 50 percent ethyl acrylate having a viscosity in a 40 percent solution of toluene of 480 to 640 centipoises at 30° C.;
d. 450 parts by weight of a copolymer of 75 percent methyl methacrylate and 25 percent methyl acrylate having a viscosity in a 40 percent solution of toluene of 855 to 1,700 centipoises at 30° C.;
e. and 225 parts by weight of toluene.

3,860,551
METHOD OF MAKING STABLE EMULSIONS OF IMMISCIBLE SOLUTIONS OF THERMOPLASTIC POLYMERS AND ETHYLENICALLY UNSATURATED MONOMERS

Munisamappa Narayana; Henno Keskkula; Jerry E. Mason, all of Hemlock, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 115,687, Feb. 16, 1971, abandoned, which is a continuation-in-part of Ser. No. 840,502, July 9, 1969, abandoned. This application Oct. 2, 1972, Ser. No. 293,785
Int. Cl. C08f *45/28*
U.S. Cl. 260—33.6 A **9 Claims**

1. A method of making a stable emulsion of solutions of at least two different polymers in a mutual solvent comprising intimately incorporating with one another from 5 to 40 parts by weight of polymer X as the discontinuous phase per 100 parts by weight of polymer Y as the continuous phase in from 100 to 900 parts by weight of a mutual solvent and from 0.5 to 5 percent by weight based on the weight of the mixture of a soluble block copolymer of the type ABA or AB wherein A or B is identical with Y, and which block copolymer has an inherent viscosity between 1.3 and 3.7.

3,860,552
COPOLYMER COMPOSITIONS AND METHOD OF PREPARATION

Jean Pierre Montillier, Trumbull, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Sept. 12, 1973, Ser. No. 396,447
Int. Cl. C08f *45/28*
U.S. Cl. 260—33.6 UA **6 Claims**

1. A composition of matter which is a stable, non-aqueous polymeric dispersion prepared without the presence of a dispersing agent for maintaining the polymeric material as discrete particles, comprising: a copolymer of a low molecular weight unsaturated ester selected from the group consisting of vinyl acetate, vinyl propionate, methyl acrylate, ethyl acrylate, methyl methacrylate and ethyl methacrylate and at least one copolymerizable long chain C_6 to C_{20} aliphatic ethylenically unsaturated monomer selected from the group consisting of long chain acrylic, methacrylic and vinyl esters in a petroleum fraction organic liquid carrier selected from the group consisting of paraffinic hydrocarbon and isoparaffinic hydrocarbon, wherein said low molecular weight unsaturated ester and said C_6 to C_{20} aliphatic ethylenically unsaturated monomer are present in a ratio from about 95 to 5 to about 50 to 50 weight percent.

3,860,553
ACID-MODIFIED POLY(VINYL ACETATE-VINYL PROPIONATE) TEXTILE SIZES

Donald D. Donermeyer, Springfield, and Albert E. Corey, Longmeadow, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 186,441, Oct. 4, 1971, Pat. No. 3,759,858. This application May 25, 1973, Ser. No. 363,903
Int. Cl. C08f *45/30*
U.S. Cl. 260—33.8 UA **8 Claims**

8. A textile size which comprises an organic solution of an interpolymerization product consisting essentially of from 50 to 92 percent by weight of vinyl acetate, from 5 to 40 percent by weight of vinyl propionate and from 3 to 10 percent by weight of an ethylenically unsaturated carboxylic acid selected from the group consisting of acrylic acid, crotonic acid, isocrotonic acid, monomethyl maleate and monomethyl fumarate, wherein the percent by weight is based on the total weight of the monomers; wherein the interpolymer in dimethyl sulfoxide at a concentration of 1 gram per 100 ml. has a specific viscosity in the range of from 1.3 to 10 at 25° C.; wherein the size contains from 1 to 25 percent by weight of interpolymer based on the total weight of solution; and wherein the solvent portion of the solution is a chlorinated aliphatic hydrocarbon selected from the group consisting of methylene chloride, methylene bromide, chloroform, bromoform, ethylene dichloride, ethylene dibromide, ethylidene chloride, ethylidene bromide, s-tetrachloroethane, hexachloroethane, s-dichloroethylene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethylene, trimethylene bromide, trichlorobromoethane, trichloromethane, 1,2,3-trichloropropane, 1,1,2-trichloropropane, trifluoro-1,1,2-tribromoethane, trifluoro-1,1,2-trichloroethane, 2,2-dichloro-1-bromoethane, 1,3-dichloro-2-methylpropane, 1,2-dichloro-2-methyl-propane, 1,1-diiodoethane.

3,860,554
SILICONE RUBBER COMPOSITION YIELDING A STRUCTURAL ASH ON COMBUSTION

Carl Newton Bruns, Adrian, Mich., assignor to Stauffer Chemical Company, Adrian, Mich.

Division of Ser. No. 257,056, May 25, 1972, Pat. No. 3,772,239, which is a continuation of Ser. No. 749,578, Aug. 2, 1968, abandoned. This application July 23, 1973, Ser. No. 381,938
Int. Cl. C08g *51/04*
U.S. Cl. 260—37 SB **6 Claims**

1. A ceramic composition having structural integrity which is obtained by heating a heat curable composition containing a trimethylsiloxy end-blocked gum copolymer consisting essentially of chemically combined dimethylsiloxane units and methylvinylsiloxane units, a peroxide catalyst and from about 20 to about 100 parts by weight based on 100 parts by weight of the gum copolymer of sodium metasilicate and from about 5 to about 20 parts by weight based on 100 parts by weight of the gum copolymer of an inorganic mineral compound having a melting point higher than sodium metasilicate to a combustion temperature of from about 500° F. to about 6,000° F.

3,860,555

POLYMERIZABLE COMPOSITIONS AND ARTICLES PRODUCED THEREFROM AND METHOD

Gilbert Chretien, Chauny; Philippe Girard, Autreville; Jean-Marc Lamy, Villequier-Aumont, and Christophe Menard, Sinceny, all of France, assignors to Rhone-Progil, Paris, France

Filed Oct. 5, 1972, Ser. No. 295,266
Claims priority, application France, Oct. 6, 1971, 71.35950
Int. Cl. C08g *17/16*
U.S. Cl. 260—40 R 14 Claims

1. A polymerizable composition, which comprises an unsaturated polyester, at least one monomer having an ethylenic double bond, and a catalyst comprising a tertiary butyl perester of a chlorinated aliphatic monoacid, the acid having from 3 to 12 carbon atoms, the catalyst being present in an amount within the range of 0.05 to 0.2% based on the weight of the active oxygen to the total weight of the polyester and monomer.

3,860,556

LOW WATER ABSORPTION DENTAL RESTORATIVE

Charles W. Taylor, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 873,600, Nov. 3, 1969, abandoned, which is a continuation-in-part of Ser. Nos. 713,318, March 15, 1968, Pat. No. 3,597,389, and Ser. No. 744,326, July 12, 1968, Pat. No. 3,541,068. This application Nov. 1, 1971, Ser. No. 194,510
Int. Cl. C08f *45/04*
U.S. Cl. 260—42.52 7 Claims

1. A stable dental restorative composition having, after hardening and exposure to moisture, moisture absorption of less than 1 percent by weight, said composition comprising glassy or crystalline inorganic non-metallic filler and, as binder, a liquid polymerizable organic binder consisting essentially of 0.05 to 5 percent of mononuclear aromatic tertiary amine accelerator for free-radical polymerization and a polycarbinol polymethacrylate or polyacrylate, substantially free from active hydrogen atoms and devoid of peroxides, of the formula

$MO(DO)_nX(OD)_nOM$

wherein M is methacrylate or acrylate, D is unsubstituted alkylene of 2to about 6 carbon atoms, *n is* 1 to 4 and X is the nucleus of a diphenol of at least two aromatic rings and from 12 to 24 carbon atoms.

3,860,557

ELECTROSTATIC METHOD OF APPLYING MULTILAYER COATING AND PRODUCT PRODUCED THEREBY

John M. Millar, Joppa, and William F. Moran, Randallstown, both of Md., assignors to Beatrice Foods Co., Chicago, Ill.

Division of Ser. No. 107,559, Jan. 18, 1971, Pat. No. 3,770,482. This application Aug. 2, 1973, Ser. No. 384,900
Int. Cl. C08f *45/04*
U.S. Cl. 260—41 R 13 Claims

1. A powdered composition for electrostatically coating a conductive substrate, said composition being a mixture of discrete powders consisting essentially of about 4 to about 30% by weight of zinc powder having an average particle size of less than about 50 microns, about 10 to about 86% by weight of an epoxy polymer powder having an average particle size of about 10 to about 300 microns and 0 to about 70% by weight of a thermoplastic film-forming non-conductive organic polymer powder having an average particle size of about 10 to about 300 microns wherein the dielectric constant of said thermoplastic organic polymer is at least 0.1 less than the dielectric constant of said epoxy polymer, the specific gravity of the zinc is at least three times that of the epoxy polymer and of the thermoplastic organic polymer, and the specific gravity of the epoxy polymer is at least 0.1 higher than the specific gravtiy of said thermoplastic, organic polymer.

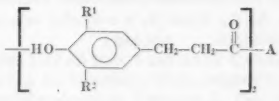
3,860,558

STABILIZED POLYAMIDE COMPOSITIONS

Peter Klemchuk, Yorktown Heights, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 7, 1970, Ser. No. 95,912
Int. Cl. C08g *51/56, 51/60*
U.S. Cl. 260—45.8 N 10 Claims

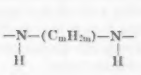
1. A synthetic polyamide composition stabilized against oxidative and thermal deterioration which comprises a polyamide having recurring amide groups as integral parts of the main polymer chain, from about 0.01 to about 0.25 weight percent of a metal hypophosphite, wherein said metal is selected from the groups Ia, IIa or IIb of the periodic table, and from about 0.01 to about 5 weight percent of a hindered phenolic compound having the formula:



wherein

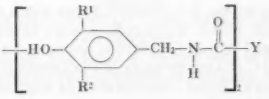
R^1 and R^2 are lower alkyl of from 1 to 6 carbon atoms and

A is selected from the group consisting of



and

where *m* is a number from 2 to 8 and $-(C_mH_{2m})-$ is linear or cyclic, or



wherein

R^1 and R^2 are as defined above and

Y is alkylene from 1 to 10 carbon or of $-C_2H_4-S-C_2H_4-$.

3,860,559

METHOD OF PREPARING A SOLUBLE HIGH MOLECULAR WEIGHT AROMATIC POLYAMIDE IMIDE COMPOSITION

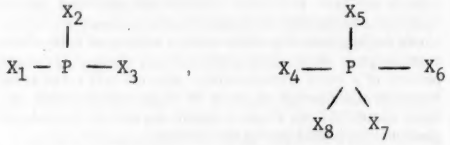
Muneyoshi Minami, and Masaharu Taniguchi, both of Itsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Feb. 22, 1973, Ser. No. 334,876
Int. Cl. C08g *20/32*
U.S. Cl. 260—47 CP 11 Claims

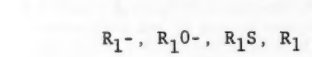
1. A method of producing a soluble high molecular weight polyamide imide composition which comprises the steps of

1. polymerizing and ring closing (a) an aromatic diamino compound and (b) an aromatic tribasic carboxylic acid compound having two carboxyl groups attached to adjacent carbon atoms either in acid form or as anhydride, ester, amide, or ammonium salt derivative thereof, in about equimolar ratio, said ester comprising a reaction product of said tricarboxylic acid with an alcohol having 1–8 carbon atoms, said amide comprising a reaction product of said tricarboxylic acid and a secondary amine of an aliphatic cycloaliphatic or aryl radical of C_1 to C_8 or

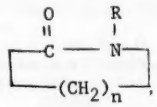
ammonia, wherein said aromatic diamino compound has 1–3 benzene rings and 6–24 carbon atoms and said tribasic carboxylic acid compound has 1–3 benzene rings and 9–27 carbon atoms, in the presence of about 0.5–15 mol % of phosphorus compound, based on the reactants, selected from the group consisting of



and condensates thereof selected from the group consisting of intra- and inter-molecular condensates, wherein each of X_1, X_2, X_3, X_4, X_5, X_6, $X_7$and X_8 is a member selected from the group consisting of



and azido and each of R_1 and R_2 is a group selected from the group consisting of hydrogen, alkyl having 1–15 carbon atoms, cycloalkyl having 6–20 carbon atoms, aryl having 6–20 carbon atoms and heterocyclic radical having at least one atom of O, S, or N, and having 5 or 6 ring member atoms in an organic solvent selected from the group consisting of an N-substituted lactam having the formula



a quinoline having 9–11 carbon atoms and a phenol having 6–18 carbon atoms, wherein R is alkyl having 1–8 carbon atoms or aryl having 6–8 carbon atoms and *n* is an integer from 3 to 11, at a temperature of from about 200° C to about 350° C with an initial concentration of reactants in the total mixture of 40–90% by weight and

2. diluting said mixture with said solvent to less than 40% by weight of reactant concentration as the polymerization reaction progresses.

3,860,560

BASIC DYEABLE POLYAMIDES

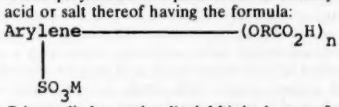
Gerald Wayne Davis, Charlotte, N.C., and Jimmy Bernard Sheats, Nashville, Tenn., assignors to Fiber Industries, Inc., Charlotte, N.C.

Filed Jan. 7, 1972, Ser. No. 216,291

Int. Cl. C08g *20/20, 20/38*

U.S. Cl. 260—49 **5 Claims**

1. A fiber-forming polyamide which comprises the polymerization product obtained from dicarboxylic acid-diamines, aminocarboxylic acids or mixtures thereof reacted in the presence of from about 0.5 to 2.5 mole per cent based on the weight of the polymerization product of a sulfoaryloxycarboxylic acid or salt thereof having the formula:



wherein R is an alkyl or aryl radical, M is hydrogen of a monovalent metal, and n =1 or 2.

3,860,561

PROCESS FOR THE PRODUCTION OF EPOXY-NOVOLAK RESINS AND PRODUCTS THEREOF

Silvio Vargiu; Sesto S. Giovanni; Mario Pitzalis, all of Milan, and Giancarlo Crespolini, Bergamo, all of Italy, assignors to Societa 'Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Aug. 9, 1973, Ser. No. 387,227

Claims priority, application Italy, Sept. 20, 1972, 29425/72

Int. Cl. C08g *5/18*

U.S. Cl. 260—59 EP **6 Claims**

1. A process for the production of a solid epoxy-novolak resin which comprises

a. adding to a fused novolak phenolic resin having an average molecular weight of about 500 to 650 and containing about 5 to 6 phenolic hydroxyl groups per molecule at about 80° to 100°C sodium hydroxide in a quantity of about 2 to 10 wt.% of the total quantity of the sodium hydroxide to be used, the total quantity of sodium hydroxide to be used corresponding to about 0.9 to 1.1 equivalents of sodium hydroxide per mole equivalent of phenolic hydroxyl groups of the novolak phenolic resin,

b. adding to the reaction mixture obtained in accordance with

a. in the course of at least about 2 hours at temperatures of about 80° to 100°C an epihalohydrine in a quantity of about 3 to 6 moles per mole equivalent of phenolic hydroxyl group of the novolak phenolic resin,

c. adding to the reaction mixture obtained in accordance with (b) in the course of at least about 3 hours at temperatures of about 85° to 110°C the remainder of the sodium hydroxide and

d. separating from the reaction mixture obtained in accordance with (c) the solid epoxy-novolak resin.

3,860,562

NOVEL PROCESS FOR PREPARING OXYMETHYLENE POLYMER

Masaru Yoshida; Yoshiaki Nakase, and Akihiko Ito, all of Takasaki, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Continuation-in-part of Ser. No. 144,636, May 18, 1971, Pat. No. 3,719,637. This application Dec. 18, 1972, Ser. No. 315,792

Claims priority, application Japan, May 20, 1970, 45-42381; July 4, 1970, 45-58143

Int. Cl. C08g *1/20*

U.S. Cl. 260—67 FP **3 Claims**

1. A process for preparing a heat-stabilized oxymethylene polymer, comprising polymerizing tetraoxane using *p*-chloranil as an electron acceptor substance, said *p*-chloranil being present in an amount of about 10^{-5} to 70 percent by weight of the tetraoxane.

3,860,563

HEAT HARDENABLE FILM-FORMING COPOLYMERS WHICH ARE SOLUBLE IN ORGANIC SOLVENTS

Themistoklis Katsimbas, Hamburg; Horst Dalibor, Norderstedt; Hans-Joachim Kiessling, Hamburg, and Rolf Schmidt, Pinneberg, all of Germany, assignors to Reichhold-Albert-Chemie Aktiengesellschaft, Frankfurt/Main, Germany

Filed Sept. 10, 1973, Ser. No. 395,777

Claims priority, application Switzerland, Sept. 19, 1972, 13676/72

Int. Cl. C08f *15/40*

U.S. Cl. 260—72 R **6 Claims**

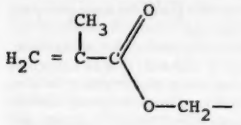
1. A heat hardenable film-forming copolymer composition comprising the interpolymerization reaction product of

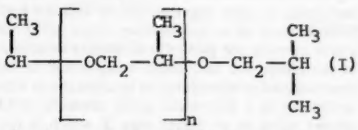
a. 32 to 40 percent by weight of styrene,

b. 1 to 3 percent by weight of acrylic acid,

c. 4 to 8 percent by weight of an ether of N-methylol- or N-butylol methacrylamide with a saturated alkanol which possesses 4 carbon atoms,

d. 48 to 56 percent by weight of n-butyl acrylate, and
e. 2 to 6 percent by weight of an ester of methacrylic acid having the formula





(I)

or mixtures of such compounds, wherein n represents a numerical value of from 2 to 6, and the compound of formula (I) or its mixtures possess a hydroxyl number of from about 100 to about 200, and

the sum of the percentages of the components (a) to (e) is in each case 100 percent,

said interpolymerization reaction product being soluble in an aromatic hydrocarbon mixture having boiling points between 180° to 280°C.

3,860,564

LINEAR HOMOPOLYESTERS AND COPOLYESTERS BASED ON BIS(HYDROXYALKYL)BENZIMIDAZOLONES

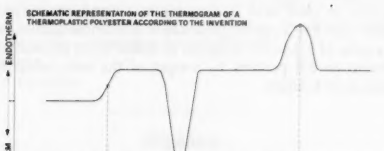
Jurgen Habermeier, Pfeffingen, Switzerland; Lothar Buxbaum, Lindenfels, Germany; Daniel Porret, Binningen, and Hans Batzer, Arlesheim, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 9, 1973, Ser. No. 387,059

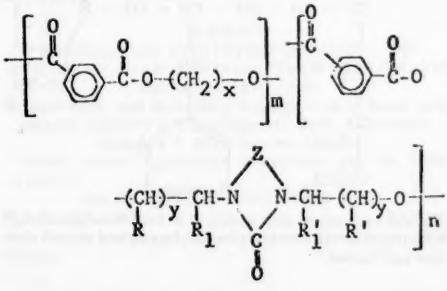
Claims priority, application Switzerland, Aug. 25, 1972, 12655/72

Int. Cl. C08g *17/08, 20/32*

U.S. Cl. 260—75 N **3 Claims**


SCHEMATIC REPRESENTATION OF THE THERMOGRAM OF A THERMOPLASTIC POLYESTER ACCORDING TO THE INVENTION
ENDOTHERM
EXOTHERM
T1 = Glass transition temperature
T2 = Crystallisation temperature
T3 = Melting point
T(°C)

1. A linear, thermoplastic homopolyester or copolyester of relative viscosity 0.5 – 3.0 dl/g, measured at 30°C on a 1% strength solution consisting of equal parts of phenol and tetrachloroethane, consisting esentially of the structural element of the formula



wherein the two carbonyl groups located on the aromatic ring are in the para- or meta-position to one another, Z denotes a divalent radical of the formulae

R and R′ independently of one another each denotes hydrogen methyl or phenyl, R_1 and R_1' each denotes hydrogen or R and R_1, and/or R_1' and R′, together denote the tetramethylene radical, *y* denotes the number 0 or 1, *x* represents a number from 2 to 10, *m* represents 0 or integers and *n* represents integers, and the porportion of *n* to *m* corresponds to the quotient $n/(m+n) = 0.005$ to 1.0.

3,860,565

ENCAPSULATED ISOCYANURATE CATALYST

Loren L. Barber, Jr., Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 1, 1973, Ser. No. 402,409

Int. Cl. C08g *22/00*

U.S. Cl. 260—77.5 NC **20 Claims**

1. A room-temperature latent, curable system comprising:
an aromatic polyisocyanate material; and

an encapsulated liquid catalyst, having a viscosity greater than about 5,000 centipoise at 25°C., for the trimerization of said polyisocyanate dispersed throughout said system, said liquid catalyst being encapsulated in capsules having a permeable shell wall comprising partially polymerized isocyanate, said permeable capsule shell wall being impermeable to said liquid catalyst at room temperature but permeable to said catalyst at temperatures above about 75°C.

3,860,566

CAPPING AND CURING OF MERCAPTOELECHELIC POLYMERS

Robert P. Zelinski, and Floyd E. Naylor, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 20, 1972, Ser. No. 290,502

Int. Cl. C08f *27/06*

U.S. Cl. 260—79.5 R **9 Claims**

1. A method of curing an organolithium-initiated mercaptotelechelic polymer which tends to self-cure an exposure to air or heat which comprises:

a. contacting said polymer with a first reactant to convert said polymer to an ester derivative;
b. contacting the ester derivative with a second reactant to convert said ester derivative to a mercaptotelechelic polymer; and
c. curing said mercaptotelechelic polymer, said polymer being selected from the group consisting of a lithium-intiated homopolymer of butadiene and a copolymer of butadiene and styrene, said first reactant is an acyl halide of the formula

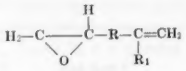
in which R is an alkyl, cycloalkyl, or aryl group or combination thereof, and in which X is a halogen atom, and said second reactant is selected from the group consisting of primary amines and secondary amines.

3,860,567
EPOXIDE AND POLYHYDROXYL-CONTAINING ACRYLIC FIBER

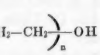
Gary Wentworth, Raleigh, N.C., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 131,468, April 5, 1971,. This application June 23, 1972, Ser. No. 272,903
Int. Cl. C08f *15/02, 27/00*
U.S. Cl. 260—80.72 2 Claims

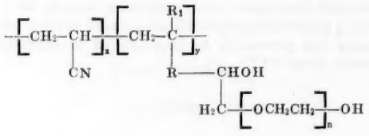
1. An acrylic filament comprising (A) at least about 85 percent by weight acrylonitrile, (B) from about 4 percent to about 15 percent by weight of an epoxide-containing vinyl monomer copolymerized with the acrylonitrile and represented by the general formula:



and (C) 4 to 11 percent by weight of a polyglycol having the general formula:



the epoxide portion of the epoxide-containing vinyl monomer being cleaved and the polyglycol chemically bonded to said portion such that the fiber has the general formula:



wherein R is a divalent radical of from 1 to about 5 carbon atoms, $-CH_2O-$, $-CH_2OCO-$, or $-CH_2-O-CH_2-$, R_1 is hydrogen or methyl, n is an integer of from 8 to 10, and the sum of x and y at least 50.

3,860,568
NOVEL POLYMERIZATION INITIATOR AND PROCESS FOR POLYMERIZATION USING THE SAME

Henri Chabert, Chapurlat; Robert Aime, Lyon; Claude Gigiou, Vernaison, and Michel Ruaud, Villeneuve Par Ternay, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Continuation of Ser. No. 637,356, May 10, 1967, abandoned. This application June 19, 1970, Ser. No. 63,999
Claims priority, application France, May 13, 1966, 66.61596
Int. Cl. C08f *3/04, 3/30, 15/02*
U.S. Cl. 260—92.8 R 5 Claims

1. Process for the polymerization of an olefinic monomer selected from the group consisting of a vinyl chloride, a vinylidene chloride, ethylene, propylene, a mixture of said monomers, and a mixture of said monomer with a vinyl ester which comprises contacting said monomer, at a temperature from −30° to +100°C, with a polymerization initiator consisting essentially of a combination of (1) an oxidizing agent selected from the group consisting of hydrogen peroxide, persulphates, permanganates, chlorates, perchlorates, bichromates, bromates, ceric salts, oxaziranes, and organic peroxides and hydroperoxides, (2) a chelate compound of a metal in which compound the metal is still capable of accepting one or more electron pairs from an electron donor, the said chelate compound having the formula:

$$Xn[MQ_s(D_pA)_m]$$

in which X represents an anion or a cation; n is zero, in the case of non-ionizable chelates, or an integer or an improper fraction, in the case of ionizable chelates, equal to the number of electrical charges of the ionic grouping $[MQ_s(D_pA)_m]$;

M is titanium, iron, vanadium, aluminum, tin, manganese, chromium, cobalt, copper, zinc, or bismuth; Q is an oxygen or sulphur atom or a lower alkyl or lower alkoxy group; D is an electron doublet donor group selected from the group consisting of carbonyl, carboxyl, amino, imino, amido, hydroxy, and mercapto; A joins together the D radicals and either is a valence bond or a hydrocarbon chain of up to 12 carbon atoms carrying the groups D terminally or at any point on or in the chain, the said chain being linear or branched and unsubstituted or substituted by an aromatic or a cycloaliphatic residue or is a polyvalent cyclic aromatic residue, p is an integer equal to or higher than **2**, which is the number of donor groups in the ligand of formula DpA, s is zero or an integer, and m is an integer equal to or higher than 1, s and m being such that pm + s has a value lower than the maximum coordination number of the metal M, the ratio of the number of gram-atoms of M to the number of moles of oxidizing agent being equal to or greater than 0.24:1 and (3) an electron donor in amount at most equal to that required to complex completely the metal of the chelate compound, the said electron donor being selected from the group consisting of amines, alcohols, ethers, aldehydes, ketones, imines, oximes, amides, sulphonamides, and phosphonamides, the molar proportions of said components (1) and (2) of the said initiator being each 0.0005 to 5 percent based on the monomer.

3,860,569
TREATMENT OF TALL OIL FATTY ACIDS

Benjamin F. Ward, Isle of Palms, S.C., assignor to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 216,226, Jan. 7, 1972. This application Dec. 20, 1973, Ser. No. 426,503
Int. Cl. C09f *1807*
U.S. Cl. 260—97.5 3 Claims

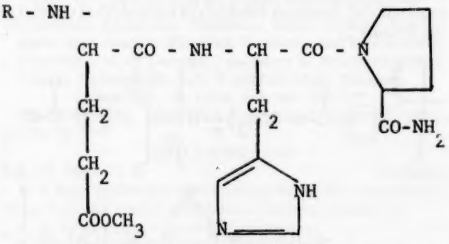
1. The method of treating the linoleic acid portion of tall oil fatty acids which comprises, converting said linoleic acid portion to oleic acid by heating at a temperature between 400°F. and 550°F. in the presence of a bromine-iodine catalyst at a ratio of 1:1 to 5:1 bromine to iodine in an amount of 0.06 percent to 2.0 percent by weight of the fatty acids for 10 minutes to 6 hours.

3,860,570
TRIPEPTIDE INTERMEDIATE FOR MAKING TRH

Alford Mitchell Thomas, and Paul Kurath, both of Waukegan, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 26, 1973, Ser. No. 335,625
Int. Cl. C07c *103/52;* A61k *27/00*
U.S. Cl. 260—112.5 3 Claims

1. A compound of the structure:



wherein each amino acid moiety is in the L-configuration, R is hydrogen or the benzyloxycarbonyl group and an acid addition salt thereof.

3,860,571
BASIC AZO DYESTUFFS FROM AN 1-ARYL-5-HYDROXY-OR-AMINO-PYRAZOLE COUPLING COMPONENT

Visvanathan Ramanathan, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

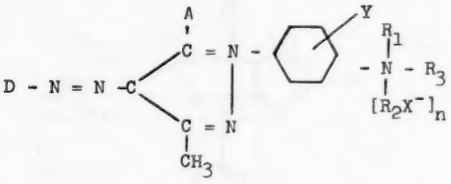
Filed June 17, 1971, Ser. No. 154,168

Claims priority, application Switzerland, July 8, 1970, 10308/70; Apr. 23, 1971, 5941/71The portion of the term of this patent subsequent to May 16, 1989, has been disclaimed.

Int. Cl. C09b *29/38;* **D06p** *3/76*

U.S. Cl. 260—156 **11 Claims**

1. A basic azo dyestuff of the formula



wherein

A is OH or NH_2;

D is phenyl, thiazolyl, benzthiazolyl, pyrazolyl, indazolyl, triazolyl, thiadiazolyl, pyridyl or quinolyl that is unsubstituted or substituted by trifluoromethyl, lower alkyl, nitrile, nitro, phenylazo, lower alkoxycarbonyl, lower alkylcarbonyl, lower alkylsulphonyl, chloro, bromo, phenyl, sulphonamido, lower alkylsulphonamido, phenoxy, lower alkoxy, lower carbalkoxy or lower alkylsulphonylamino;

Y is lower alkylene or lower alkyleneoxy;

R_1 and R_2 each is hydrogen, lower alkyl, benzyl, cyclohexyl, phenyl, chloroethyl or propyl or ethyl substituted by methoxy or hydroxy;

R_3 is hydrogen, lower alkyl, benzyl, cyclohexyl, lower alkoxy, benzyloxy, cyclohexyloxy, methylamino, ethylamino, piperidine or pyrrolidine;

n is 0 or 1;

X is an anion.

3,860,572
DISPERSE AZO DYESTUFFS CONTAINING THE RESIDUE OF AN ARYL MONOESTER OF AN ALIPHATIC DICARBOXYLIC ACID

Richard Peter, and Hans-Joerg Angliker, both of Basel, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

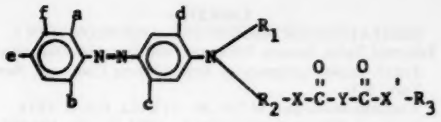
Filed July 7, 1971, Ser. No. 160,565

Claims priority, application Switzerland, July 24, 1970, 11294/70

Int. Cl. C09b *29/00, 29/26;* **D06p** *3/72*

U.S. Cl. 260—207 **5 Claims**

1. An azo compound free of sulphonic acid groups of the formula



wherein

a is hydrogen, chloro, bromo, methoxy, ethoxy, nitro, nitrile, carbomethoxy, methylsulfonyl or phenoxy,

b is hydrogen, chloro, bromo, nitrile, trifluoromethyl, methoxy or ethoxy,

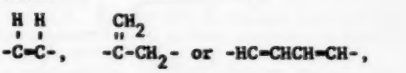
c and *d* are each hydrogen, chloro, lower alkyl, lower alkoxy, phenylthio or phenoxy and *c* additionally can be bromo, trifluoromethyl, formylamino, acetylamino, propionylamino, butyrylamino, benzoylamino, methane-or ethane sulfonyl, P-toluenesulfonyl, methoxycarbonyl, phenoxycarbonyl, aminocarbonyl, or butylaminocarbonyl,

e is nitro, nitrile, carbethoxy or methylsulfonyl,

f is hydrogen or methoxy,

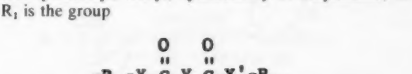
X is —NH—, —S— or —O—,

Y is alkylene of one to seven carbon atoms or a group of the formula



X′ is —NH—, —S— or —O—,

R_1 is alkyl of one to five carbon atoms or alkyl of one to five carbon atoms substituted by chloro, fluoro, phenyl, cyano, hydroxy, methoxy, ethoxy, phenoxy, carbo-(methoxy, ethoxy or propoxy), carboxyl, formylamino, acetylamino, C_1–C_4 alkanoyloxy, phenylsulfonyl, p-toluenesulfonyl, methylcarbamyloxy, phenylcarbamyloxy, (methoxy, ethoxy, or isopropoxy)- carbonyloxy, nitrophenoxy, hydroxyphenoxy, acetylethoxycarbonyl, (cyano, hydroxy, methoxy or acetoxy)-ethoxycarbonyl, acetyl, cyanoethoxy or ethylureido, or R_1 is the group



R_2 is alkylene of up to eight carbon atoms, and

R_3 is phenyl or phenyl substituted by Cl, OCH_3, Br, CH_3, C_2H_5, CF_3 and —$NHCOCH_3$.

3,860,573
METHOD FOR CROSS-LINKING AGAROSE OR AGAR

Erkki Juhani Honkanen, and Anna Maija Teppo, both of Haukilahti, Finland, assignors to Orion-Yhtyma Oy, Helsinki, Finland

Filed Sept. 29, 1972, Ser. No. 293,560

Int. Cl. C07c *47/18, 95/04*

U.S. Cl. 260—209 R **8 Claims**

1. The method for cross-linking agarose or agar, wherein one of these substances is suspended in a substance selected from the group consisting of benzene, ether, petrol ether, toluene and dioxane, reacting the suspended substance with a compound containing two equal functional groups, each of said groups consisting of —COCl, —SO_2Cl or —N=C=S to produce cross-linking, filtering the cross-linked substance, washing the filtered cross-linked substance and then drying the washed cross-linked substance at room temperature.

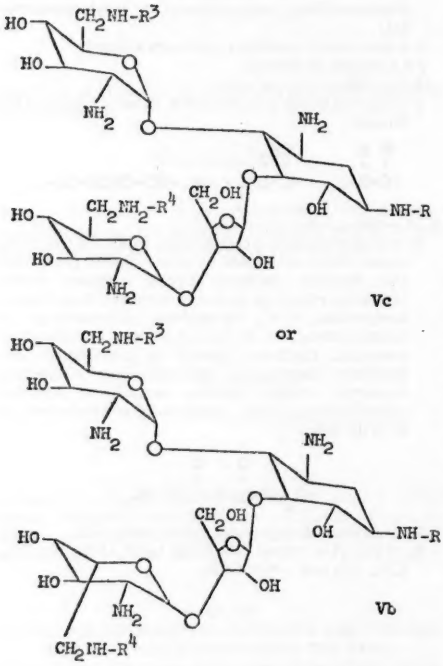
3,860,574

DERIVATIVES OF NEOMYCIN B AND NEOMYCIN C

Takayuki Naito; Susumu Nakagawa, and Masahisa Oka, all of Tokyo, Japan, assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 312,452, Dec. 6, 1972, abandoned. This application June 27, 1973, Ser. No. 374,191
Int. Cl. C07c *95/04*
U.S. Cl. 260—210 NE 13 Claims

1. A compound having the formula

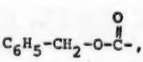


Vc

or

Vb

wherein both R^3 and R^4 are H or



R is H, L-(−)-γ-amino-α-hydroxybutyryl, L-(−)-β-amino-α-hydroxypropionyl, L-(−)-δ-amino-α-hydroxyvaleryl, L-(−)-γ-benzyloxycarbonylamino-α-hydroxybutyryl, L-(−)-β-benzyloxycarbonyl-amino-α-hydroxypropionyl, or L-(−)-δ-benzyloxycarbonylamino-α-hydroxyvaleryl, wherein R^3 and R^4 or R must be other than H; or a non-toxic pharmaceutically acceptable acid addition salt thereof.

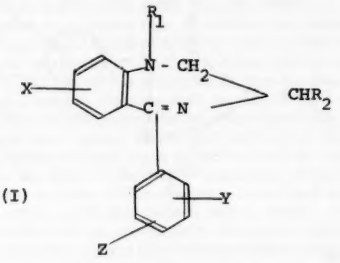
3,860,575

PURIFICATION OF BENZODIAZEPINE DERIVATIVES

Kikuo Ishizumi, Ikeda; Kazuo Mori, Kobe; Tadashi Okamoto, Ashiya; Takeshi Akase, Nishinomiya; Takahiro Izumi, Takarazuka; Mitsuhiro Akatsu, Toyonaka; Yoshiharu Kume; Shigeho Inaba, both of Takarazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 3, 1972, Ser. No. 240,804
Claims priority, application Japan, Apr. 12, 1971, 46-23249
Int. Cl. C07d *53/06*
U.S. Cl. 260—239 BD 2 Claims

1. A process for purifying 2,3-dihydro-1H-1,4-benzodiazepine derivative represented by the formula,



(I)

where R_1 is a lower (C_1–C_4) alkyl, cyclo (C_3–C_6) alkyl-(C_1 – C_4) alkyl, (C_1 – C_4) alkoxy -(C_1 – C_4) alkyl or acetoxyethyl; R_2 is a hydrogen atom or a lower (C_1 – C_4) alkyl group; X is a hydrogen or halogen atom, or a nitro or trifluoromethyl group; Y and Z are individually a hydrogen or halogen atom, or a lower (C_1–C_4) alkyl or nitro group, from a reaction mixture containing the 2,3,4,5-tetrahydro form of the benzodiazepine derivative which comprises treating the reaction mixture with acetic anhydride to acylate the 2,3,4,5-tetrahydro-1H-1,4-benzodiazepine derivative contained as impurity in the reaction mixture, neutralizing the resulting reaction mixture with an aqueous alkali solution and extracting with an organic solvent, re-extracting the separated organic layer with hydrochloric acid to recover only the hydrochloric acid salt of the compound (I) and then neutralizing the salt with an aqueous alkali solution.

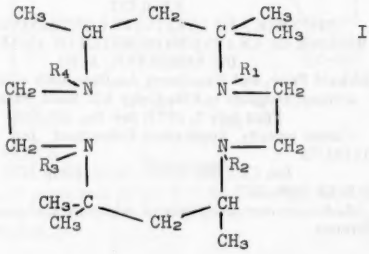
3,860,576

N-SUBSTITUTED-TETRA-AZACYCLOTETRADECANES

George E. Ham, Lake Jackson, Tex., and Don J. Temer, Albuquerque, N. Mex., assignors to The Dow Chemical Company, Midland, Mich.

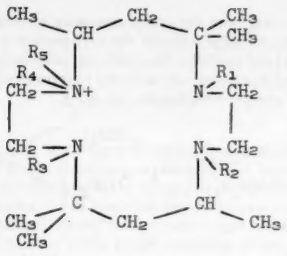
Filed Apr. 26, 1972, Ser. No. 247,748
Int. Cl. C07d *55/60*
U.S. Cl. 260—239 BC 4 Claims

1. A compound of the formula

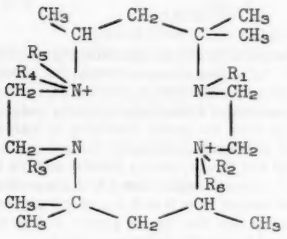


I.

II.



III.



wherein R_1-R_6 are substituted having 1-21 carbons selected from alkyl groups, hydroxyalkyl groups, hydrocarbyloxy-hydroxyalkyl groups, alkenyl groups, haloalkenyl groups, cyanoalkyl groups, carboalkoxyalkyl groups and aralkyl groups, and X is chlorine, bromine, or iodine.

3,860,577

AMINOAZETIDINONEACETIC ACID ESTERS

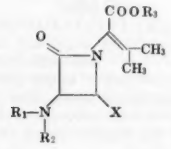
Stjepan Kukolja, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 148,129, May 28, 1971, abandoned. This application July 20, 1972, Ser. No. 273,550

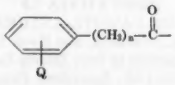
Int. Cl. C07d *25/02, 27/10, 27/52*

U.S. Cl. 260—239 A **1 Claim**

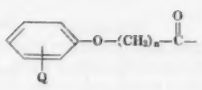
1. A compound having the formula



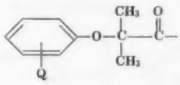
wherein R_1 is a acyl group selected from the group consisting of a group of the formula



wherein Q is selected from the group consisting of hydrogen and one or more substituents selected from the group consisting of C_1 to C_3 alkyl, C_1 to C_3 alkoxy, nitro, halogen, carboxy and trifluoromethyl and n is zero or an integer from 1 to 5; a group of the formula



wherein Q and n are as defined above; a group of the formula



wherein Q is defined above; and, a group of the formula

wherein R_4 is hydrogen or C_1 or C_6 alkyl;

R_2 is hydrogen,

or, R_1 and R_2 , together with the nitrogen atom to which they are bonded define an imido group selected from the group consisting of phthalimido and succinimido;

R_3 is selected from the group consisting of C_1-C_4 alkyl, trichloroethyl, benzyl, p-nitrobenzyl, p-methoxybenzyl, benzhydryl, phthalimidomethyl and phenacyl; and,

X is selected from the group consisting of chloro, bromo and C_2 to C_6 alkanoyloxy.

3,860,578

2-(N-ALKYLCARBAMOYLOXIMIDO)-POLYMETHYLENEIMINES

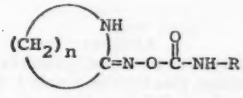
Kyu Tai Lee, 2329 Jamaica Dr., Wilmington, Del. 19810

Filed Mar. 5, 1973, Ser. No. 338,249

Int. Cl. C07d *41/00*

U.S. Cl. 260—239 BF **6 Claims**

1. Compounds of the formula



where *n* is an integer from 6–11 inclusive and R is methyl or ethyl.

3,860,579

PHTHALIDE PENICILLIN ESTER AND SALTS

Harry Ferres, and John Peter Clayton, both of Horsham, England, assignors to Beecham Group Limited, Brentford, Middlesex, England

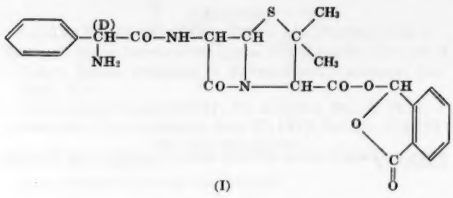
Filed June 5, 1972, Ser. No. 259,560

Claims priority, application Great Britain, June 9, 1971, 19604/71

Int. Cl. C07d *99/22*

U.S. Cl. 260—239.1 **2 Claims**

1. The phthalide ester of 6[D(-)α-aminophenylacetamido] penicillanic acid of formula (I) or a pharmaceutically acceptable acid addition salt thereof:



(I)

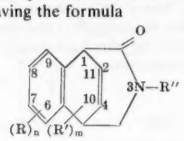
3,860,580
1,5-ETHENO-2H-3-BENZAZEPIN-2-ONES

Rene Denayer, 17, avenue des Statuaires, B-1180, Brussels, Belgium

Filed July 10, 1972, Ser. No. 270,065
Claims priority, application Great Britain, July 12, 1971, 32545/71
Int. Cl. C07d *41/08*
U.S. Cl. 260—239.3 T 12 Claims

1. A member selected from the group consisting of

a. a 1,3,4,5-tetrahydro-1,5-etheno-2H-3-benzazepin-2-one derivative having the formula



in which R and R′ represent each a member selected from the group consisting of hydrogen, halogen, hydroxyl, alkyl having 1 to 4 carbon atoms and alkoxy having 1 to 4 carbon atoms, R″ represents a member selected from the group consisting of hydrogen, alkyl, hydroxyalkyl, dialkylaminoalkyl and carbalkoxy, each alkyl having 1 to 5 carbon atoms, alkenyl having 2 to 4 carbon atoms, methoxybenzyl and carbamyl having the formula —CONHR‴, in which R‴ is hydrogen, alkyl having 1 to 4 carbon atoms, alkenyl having 2 to 4 carbon atoms, or phenyl, and

n and *m* are each a whole number 1 or 2, and

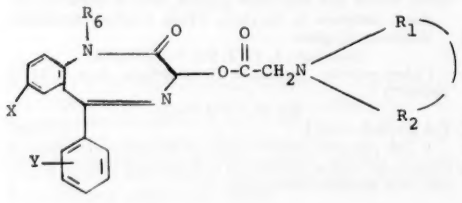
b. an addition salt thereof with a pharmaceutically acceptable acid.

3,860,581
PREPARATION OF 1,4-BENZODIAZEPINES

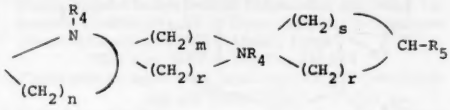
Abraham Nudelman, Bala Cynwyd; Ronald J. McCaully, Malvern, and Stanley C. Bell, Penn Valley, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

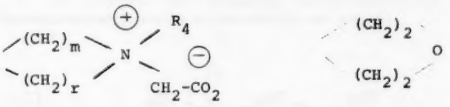
Filed Dec. 27, 1972, Ser. No. 318,817
Int. Cl. C07d *53/06*
U.S. Cl. 260—239.3 D 10 Claims

1. A method for synthesizing the compound having the following formula

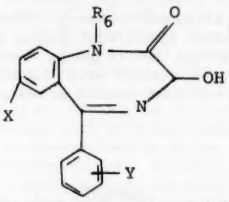


wherein R_1 is selected from the group consisting of (lower) alkyl and aryl (lower) alkyl wherein the aryl portion is selected from phenyl and naphthyl; R_2 is di(lower)alkylamino(lower)alkyl; R_1 and R_2 may be concatenated to form a radical selected from the group consisting of

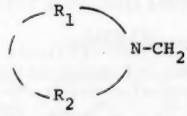




wherein R_4 is selected from the group consisting of (lower) alkylaryl wherein the aryl portion is phenyl or naphthyl, (lower) alkyl and (lower) alkoxy (lower) alkyl; R_5 is selected from the group consisting of (lower) dialkylamino and piperidino; R_6 is selected from the group consisting of hydrogen, (lower) alkyl, aryl (lower) alkyl wherein the aryl portion is phenyl or naphthyl and (lower) alkoxy (lower) alkyl; *n* is an integer from 3 to 5; *m* is an integer from 1 to 2; *r* is an integer from 2 to 3; *s* is an integer from 0 to 6; *t* is an integer from 0 to 6; with the proviso that the sum of *s* and *t* is 3 to 6; by reacting a compound having the following formula



wherein X is selected from the group consisting of halogen, cyano, trifluoromethyl, nitro and (lower) alkylthio and Y is selected from the group consisting of hydrogen, halogen, trifluoromethyl, nitro and (lower) alkylthio with a solution of the following compounds:



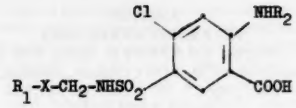
wherein R_1 and R_2have the same significance as herein described above; and a compound selected from the group consisting of 1,1-carbonyldiimadazole, thionyldiimidazole, bis-(2,4dinitrophenyl)carbonate, dicyclohexylcarbodiimide and ethylchloroformate at a temperature of about 25°C to about 80°C in a suitable solvent.

3,860,582
DERIVATIVES OF 4-CHLORO-5-SULFAMOYL-ANTHRANILIC ACID

Shlomo Schoenberg, Jerusalem, and Haim Yellin, Ramat Gan, both of Israel, assignors to Teva Middle East Pharmaceutical & Chemical Works Ltd., Jerusalem, Israel

Filed July 12, 1972, Ser. No. 271,314
Claims priority, application Israel, July 20, 1971, 37345; Feb. 22, 1972, 38812
Int. Cl. C07d *5/16*; A61k *27/00*
U.S. Cl. 260—239.6 26 Claims

1. A compound of the formula



I

in which X is oxygen or sulfur, R_1 is a member selected from the group consisting of straight and branched-chain lower alkyl radicals of up to 10 carbon atoms optionally substituted by hydroxy and lower alkoxy, cyclohexyl radical, allyl radical, propargyl radical, benzyl radical and furfuryl radical, and R_2 is a member of the group consisting of straight and branched-chain alkyl radicals having up to 4 carbon atoms, benzyl, furfuryl, thenyl, pyrrolyethyl and cyclohexyl radicals, or physiologically acceptable salt thereof.

3,860,583

INDOLENINE DYESTUFFS

Ernst Schmitt, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

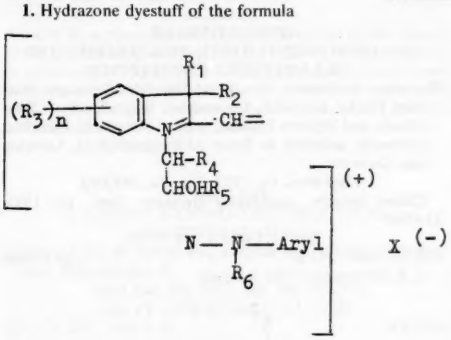
Filed Dec. 9, 1971, Ser. No. 206,537

Claims priority, application Germany, Dec. 9, 1970, 2060614

Int. Cl. C07d *27/38*

U.S. Cl. 260—240 G **8 Claims**

1. Hydrazone dyestuff of the formula



in which

R_1 and R_2 are C_1-C_4-alkyl, chloromethyl, trifluoromethyl, β-chloroethyl, β-methoxyethyl, β-cyanoethyl or β-dimethylaminoethyl;

3,860,584

4,4'-BIS-[BENZOXAZOLYL-(2)]-STILBENES

Hans Rudolf Meyer, Binningen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

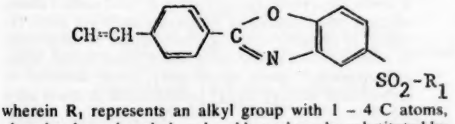
Filed Oct. 16, 1972, Ser. No. 298,188

Claims priority, application Switzerland, Oct. 21, 1971, 15405/71; Apr. 14, 1972, 5595/72

Int. Cl. C07d *85/48*

U.S. Cl. 260—240 CA **4 Claims**

1. A stilbene derivative of the formula



wherein R_1 represents an alkyl group with 1 – 4 C atoms, phenyl or benzyl, and phenyl and benzyl can be substituted by chlorine or methyl.

3,860,585

PENICILLIN KETENIMINE INTERMEDIATES FOR PREPARING OXACILLIN

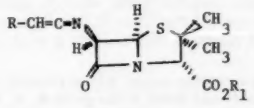
Ronnie D. Carroll, East Lyme; Ernest S. Hamanaka, Groton; Donald K. Pirie, Montville, and Willard M. Welch, Jr., North Stonington, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Nov. 2, 1971, Ser. No. 194,923

Int. Cl. C07d *25/02*

U.S. Cl. 260—240 R **7 Claims**

1. A compound of the formula:



wherein R is selected from the group consisting of phenyl and phenoxy and

R_1 is selected from the group consisting of 1-alkanoyloxyalkyl wherein said alkanoyloxy has from 2 to 5 carbon atoms and said alkyl has from 1 to 4 carbon atoms; phenacyl; benzyl and substituted benzyl wherein said substituent is selected from the group consisting of 4-bromo, 4-nitro and 3,5-di-t-butyl-4-hydroxy; bis(4-methoxyphenyl)methyl; trimethylsilyl; and benzylideneimino.

3,860,586

DERIVATIVES OF 4-(2-AMINOPHENYL)-3-THIOALLOPHANIC ACID

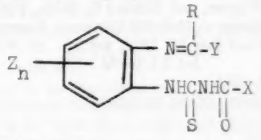
Edward E. Kilbourn, Chalfont; William D. Weir, Levittown, and Harold E. Carley, Chalfont, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 22, 1973, Ser. No. 325,277

Int. Cl. C09b *23/00*

U.S. Cl. 260—240 G **7 Claims**

1. A compound of the structure



wherein X is R^1O— or R^1S—

R^1 is

a. alkyl, straight or branched, of 1 to 12 carbon atoms,

b. alkyl of 1 to 12 carbon atoms substituted with halo or methoxy groups,

c. alkenyl of 2 to 12 carbon atoms,

d. alkynyl of 3 to 12 carbon atoms,

e. phenyl,

f. phenyl substituted with halo, methyl, methoxy or nitro,

g. benzyl or

h. benzyl substituted with halo, methyl, methoxy or nitro;

Y is a heterocyclic radical selected from the group consisting of 2-furyl, 5-isothiazolyl, 1-methylpyrryl, 2-pyridyl, 2-pyrryl, 4-thiazolyl and 2-thienyl, and the acetoxy, chloro, methyl or nitro substituted derivatives of these;

R is hydrogen or methyl;

Z is halo, methyl, methoxy or nitro and

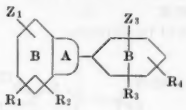
n is an integer 0 to 3.

3,860,587
METHINE COMPOUNDS

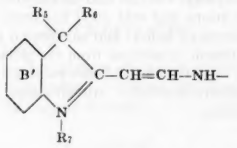
Toshiki Tanaka, Wakayama, Japan, assignor to Nippon Chemical Works Co., Ltd., Wakayama-ken, Japan

Filed July 28, 1972, Ser. No. 276,263
Int. Cl. C07d 55/04
U.S. Cl. 260—240.1 13 Claims

1. A methine compound of the formula



wherein B is a benzene group; A is an oxazole, thiazole, imidazole or triazole ring fused to the group B; R_1, R_2, R_3 and R_4, which may be the same or different, are individually a hydrogen or halogen atom, or a phenyl, alkyl, alkoxy, cyano, amino, or dialkylamino group; and either one or two of Z_1 and Z_3 are indole derivatives of the formula,



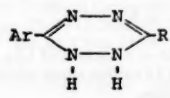
wherein B′ is a benzene group; R_5 and R_6, which may be the same or different, are individually an alkyl group; and R_7 is an alkyl or cyanoalkyl group; and wherein the alkyl and alkoxy moieties each have 1 or 2 carbon atoms.

3,860,588
DIHYDROTETRAZINE HERBICIDES

Kurt H. G. Pilgrim, and Richard D. Skiles, both of Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed July 23, 1973, Ser. No. 381,935
Int. Cl. C07d 55/58
U.S. Cl. 260—241 6 Claims

1. A compound of the formula:



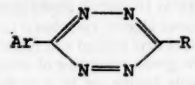
wherein Ar is phenyl or phenyl substituted by from 1 to 3 substituents located on the carbon atoms in the 3-, 4- and 5-positions on the ring relative to the carbon bonded to the tetrazine ring and selected from halogen; nitro; cyano; carboxy-, a moiety having from 1 to 5 Carbon atoms selected from the group consisting of alkyl, mono- and polyhaloalkyl, alkoxy, mono- and poly-haloalkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, mono- and polyhaloalkylthio, mono- and polyhaloalkylsulfinyl and mono- and polyhaloalkylsulfonyl; amino ($-NR^1R^2$, wherein R^1 and R^2 each is hydrogen or C_1–C_5-alkyl); or sulfamoyl ($-SO_2NR^1R^2$, wherein R^1 and R^2 is each hydrogen or C_1–C_5 alkyl), and R is C_1–C_7-perfluoroalkyl.

3,860,589
TETRAZINE HERBICIDES

Kurt H. G. Pilgrim, and Richard D. Skiles, both of Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed July 23, 1973, Ser. No. 381,934
Int. Cl. C07d 55/58
U.S. Cl. 260—241 7 Claims

1. A compound of the formula:



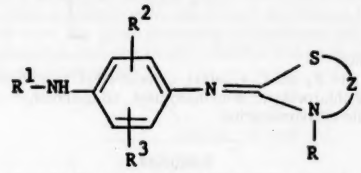
wherein Ar is phenyl or phenyl substituted by from 1 to 3 substituents located on the carbon atoms in the 3-,4- and 5-positions on the ring relative to the carbon bonded to the tetrazine ring and selected from halogen; nitro; cyano; carboxy-, a moiety having form 1 to 5 carbon atoms selected from the group consisting of alkyl, mono- and polyhaloalkyl, alkoxy, mono- and poly-haloalkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, mono- and polyhaloalkylthio, mono- and polyhaloalkylsulfinyl and mono- and polyhaloalkylsulfonyl; amino ($-NR^1R^2$, wherein R^1 and R^2 each is hydrogen or C_1–C_5-alkyl); or sulfamoyl and R^2 is each hydrogen or C_1–C_5 alkyl) ($-SO_2NR^1R^2$, wherein R^1, and R is C_1–C_7-perfluoroalkyl.

3,860,590
DERIVATIVES OF 2-(4-AMINOPHENYLIMINO)-THIAZOLIDINE AND 4H-5,6-DIHYDRO-1,3-THIAZINES

Hartmund Wollweber, Wuppertal-Elberfeld, Germany; Winfried Flucke, Beenleigh, Queensland, Australia; Hans Peter Schulz, and Herbert Thomas, both of Wuppertal-Elberfeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 14, 1972, Ser. No. 289,092
Claims priority, application Germany, Sept. 14, 1971, 2145807
Int. Cl. C07d 91/16, 93/06
U.S. Cl. 260—243 R 24 Claims

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein

Z is ethylene or trimethylene unsubstituted or substituted by lower alkyl;

R is lower alkyl, lower alkenyl or lower alkynyl;

R^1 is hydrogen, lower alkyl, lower alkenyl, lower alkynyl, R^6CO or R^7SO_2 wherein R^6 is (a) hydrogen, (b) lower alkyl or lower alkoxy which is unsubstituted or substituted by (1) lower alkoxy; (2) cycloalkyl of 3to 7 carbon atoms which is unsubstituted or substituted by methyl; (3) tetrahydrofuryl; (4) thienyl or (5) phenyl or phenoxy which is unsubstituted or substituted by chloro, fluoro, bromo, lower alkyl, lower alkoxy, trifluoromethyl or nitro; (c) lower alkenyl or lower alkenyloxy which is unsubstituted or substituted by chloro; (d) lower alkynyl or lower alkynyloxy; (e) cycloalkyl of 3to 7 carbon atoms which is unsubstituted or substituted by lower alkyl; (f) phenyl or phenoxy which is unsubstituted or substituted by chloro, fluoro, bromo, lower alkyl, lower alkoxy, nitro, trifluoromethyl, lower alkanoyloxy, lower alkanoyl or carbo(lower alkoxy); or (g) unsubstituted or lower alkyl substituted furyl, thienyl, isoxazolyl, pyrimidinyl, imidazolyl, pyrazolyl, indolyl, thianaphthyl, quinolyl, phenothiazinyl, thiadiazolyl or thiazolyl and R^7 is (a) lower alkyl which is unsubstituted or substituted by (1) cycloalkyl of

3 to 7 carbon atoms which is unsubstituted or substituted by methyl, or (2) phenyl which is unsubstituted or substituted by chloro, fluoro, bromo, lower alkyl, lower alkoxy, trifluoromethyl or nitro, or (b) lower alkenyl; and

each of R^2 and R^3, independent of the other, is hydrogen, lower alkyl, lower alkenyl, lower alkoxy, chloro, nitro, or trifluoromethyl.

3,860,591

ACYLTHIOMETHYL ESTERS OF CEPHALOSPORINS

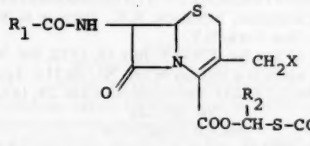
Hermann Breuer, Regensburg, Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 3, 1972, Ser. No. 277,700

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **10 Claims**

1. A compound of the formula



wherein R_1 is phenoxymethyl, phenyl-lower alkyl, and phenyl-lower alkyl bearing on the α-carbon hydroxy, amino, carboxy, or ureido, R_2 is hydrogen, lower alkyl, phenyl or phenyl-lower alkyl, R_3 is lower alkyl, lower alkenyl, phenyl, or phenyl-lower alkyl, X is hydrogen, hydroxy, or lower alkanoyloxy, and acid addition salts of the basic members thereof.

3,860,592

2-ALKOXY-3-AMINO-2-HETEROCYCLIC-THIOPROPANAMIDES

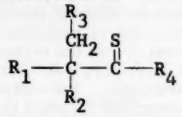
Bernard Loev, Broomall, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Jan. 10, 1973, Ser. No. 322,572

Int. Cl. C07d *87/46, 33/62, 31/50*

U.S. Cl. 260—247.1 M **6 Claims**

1. A compound of the formula:



in which:

R_1 is 2-pyridyl or 2-quinolyl;

R_2 is lower alkoxy, allyloxy or cyclopropanemethoxy;

R_3 is di-lower alkylamino, piperidino, pyrrolidino or morpholino;

R_4 is NH-(lower alkyl), N(lower alkyl)$_2$, NH-phenyl, NH-$(CH_2)_n$-cycloalkyl, said cycloalkyl having 3–6 carbon atoms, or NH-R_5;

n is 0 or 1 and

R_5 is an allyl or propargyl group optionally substituted by methyl or ethyl groups, said R_5 having 3–6 carbon atoms or a pharmaceutically acceptable acid addition salt thereof.

3,860,593

THIADIAZOLE SUBSTITUTED TRIAZINES

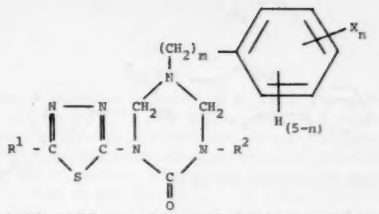
John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Oct. 10, 1972, Ser. No. 296,461

Int. Cl. C07d *55/12*

U.S. Cl. 260—248 NS **6 Claims**

1. A compound of the formula



wherein R^1 and R^2 are each lower alkyl; X is selected from the group consisting of lower alkyl, halogen, trifluoromethyl, nitro, lower alkoxy, lower alkylthio and di(lower alkyl)amino; n is an integer from 0 to 3 and m is an integer from 1 to 3.

3,860,594

PREPARATION OF AMMELIDES

Robert L. Diebner, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 29, 1972, Ser. No. 319,184

Int. Cl. C07d *55/18*

U.S. Cl. 260—249.5 **5 Claims**

1. A process for the preparation of ammelides which comprises the steps of

A. heating a mixture of biuret and a guanidine compound selected from guanidine, 1,3-diphenyl guanidine, 1,3-ditolyl guanidine, 1-methyl guanidine, 1-butyl guanidine, 1-hexyl guanidine, 1-phenyl-3-tolyl guanidine, 1,1,3-triphenyl guanidine, 1,2,3-triphenyl guanidine, and acid salts thereof, dissolved in an inert organic solvent to a temperature greater than 120°C. until the reaction is complete in the presence of an effective amount of a basic catalyst,

B. removing ammonia gas as it is evolved, and

C. recovering ammelides.

3,860,595

PRODUCTION OF CHLORIDE FROM ETHYLENE DICHLORIDE

Bruce E. Kurtz, Marcellus, and Bhaskar Bandyopadhyay, Camillus, both of N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Apr. 21, 1972, Ser. No. 246,343

Int. Cl. C07c *21/02*

U.S. Cl. 260—656 R **6 Claims**

1. A process for the manufacture of vinyl chloride monomer by cracking ethylene dichloride which comprises carrying out the reaction in the vapor phase at elevated temperatures in the range of 400° to 600°C in the presence of an additive selected from the group consisting of iodine or an iodinated aliphatic hydrocarbon containing 1 to 3 carbon atoms present in amounts in the range of 1 to 1,000 parts per million, basis iodine content.

3,860,596

2-ARYL-4-SUBSTITUTED-AMINO-5-PYRIMIDYL DERIVATIVES

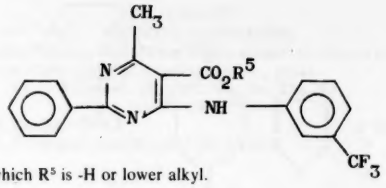
Dong H. Kim, Wayne, and Arthur A. Santilli, Havertown, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Aug. 31, 1972, Ser. No. 285,154

Int. Cl. C07d *51/42*

U.S. Cl. 260—256.4 N **8 Claims**

1. A compound of the formula:



in which R^5 is -H or lower alkyl.

3,860,597

OXYALKYLATED QUINOLINE SULFONIC ACID COMPOUND

Harold A. Palmer, and Thomas E. Sample, Jr., both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 160,142, July 6, 1971, Pat. No. 3,731,741. This application Nov. 2, 1972, Ser. No. 303,170

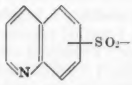
Int. Cl. C07d *33/60*

U.S. Cl. 260—283 S 3 Claims

1. A water-soluble, oxyalkylated, nitrogen-containing aromatic compound of the formula:

R (OR')mOH,

wherein R is



R' is alkylene of from 2 to 4 inclusive carbon atoms and *m* is an integer of from 5 to 50.

3,860,598

PROCESS FOR THE PRODUCTION OF BENZYLIDENE COMPOUNDS

Hans Jurgen Rosenkranz; Burkhard Lachmann, both of Krefeld, and Hans Rudolph, Krefeld-Bockum, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

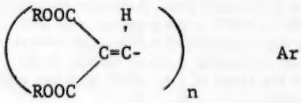
Filed Nov. 7, 1972, Ser. No. 304,527

Claims priority, application Germany, Nov. 9, 1971, 2155495

Int. Cl. C07d *33/48*

U.S. Cl. 260—287 R 10 Claims

1. A process for producing a compound of the formula



wherein R is linear or branched chain alkyl having from 1 to 20 carbon atoms or aryl, Ar is an optionally substituted mononuclear or polynuclear aromatic radical or a heteroaromatic radical of a member selected from the group consisting of pyridine, thiophene, pyrrole and quinoline and *n* is an integer of from 1 to 4, said process comprising reacting 1 mol of a compound of the formula

$Ar—(CHX_2)_n$

wherein Ar and *n* are as aforesaid and X is halogen with from 1 to 10 mols of a malonic acid ester at a temperature of from 40° to 200°C. and in the presence of from 0.001 to 10% by weight, based on the malonic acid ester, of a salt of a metal selected from the group consisting of iron, copper, cobalt and chromium.

3,860,599

PREPARATION OF HYDROXYQUINOLINES

Fred M. Covelli, Murrysville, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Dec. 14, 1972, Ser. No. 315,208

Int. Cl. C07d *33/38*

U.S. Cl. 260—289 R 10 Claims

1. A process for preparing hydroxyquinoline comprising the steps of reacting aminoquinoline with an acid selected from hydrochloric acid, sulfuric acid and phosphoric acid in an aqueous medium and then isolating the resulting hydroxyquinoline wherein the molar ratio of acid to aminoquinoline is from about 1.5:1 to about 10:1 and wherein the reaction is run at a temperature of from about 160°C to about 220°C and at a pressure of from about 75 psi to about 325 psi.

3,860,600

OCTAHYDROPYRRIDO[2,1-C][1,4]BENZODIAZEPINES

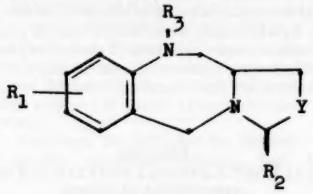
Philip M. Carabateas, Schodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 270,463, July 10, 1972, Pat. No. 3,763,183, which is a division of Ser. No. 30,315, April 20, 1970, Pat. No. 3,732,212. This application Jan. 29, 1973, Ser. No. 327,324

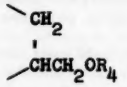
Int. Cl. C07d *53/06*

U.S. Cl. 260—293.55 9 Claims

1. A compound having the formula:



wherein R_1 is hydrogen or methylenedioxy attached to adjacent carbon atoms or from one to three members of the group consisting of lower-alkyl, lower-alkoxy, fluorine, chlorine, dilower-alkylamino, N-lower-alkyl-N-lower-alkanoylamino, hydroxy, and benzyloxy; R_2 is hydrogen, hydroxymethyl, or lower-alkanoyloxymethyl; R_3 is lower-alkyl, lower-alkanoyl, α-lower-alkanoyloxy-lower-alkanoyl, benzoyl, benzyl, or benzoyl or benzyl substituted by methylenedioxy attached to adjacent carbon atoms or from one to three members of the group consisting of lower-alkyl, lower-alkoxy, fluorine, chlorine, lower-alkylmercapto, lower-alkylsulfinyl, lower-alkylsulfonyl, or hydroxy; and Y is one of the groups: $—CH_2C-H_2—$ or



where R_4 is hydrogen or lower-alkanoyl.

3,860,601

2,6-DIAMINO-1,4-DIHYDROPYRIDINE DERIVATIVES

Horst Meyer; Friedrich Bossert; Wulf Vater, all of Bayer Aktiengesellschaft, Wuppertal-Elberfeld, and Kurt Stoepel, In den Birken 69, Wuppertal-Elberfeld, all of Germany

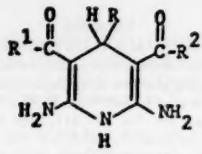
Division of Ser. No. 336,483, Feb. 28, 1973,. This application Mar. 27, 1974, Ser. No. 455,257

Claims priority, application Germany, Mar. 6, 1972, 2210687

Int. Cl. C07d *31/36*

U.S. Cl. 260—295.5 R 6 Claims

1. A compound of the formula



wherein

R is pyridyl, furyl pyrryl or thienyl, unsubstituted or substituted by one or two members selected from the group consisting of lower alkyl, lower alkoxy and halogeno; and each of R^1 and R^2, taken independently of the other, is lower alkoxy, lower alkoxy(lower alkoxy), alkenyloxy of 2 to 4 carbon atoms, alkynyloxy of 2 to 4 carbon atoms, amino, lower alkylamino or di(lower alkyl) amino.

3,860,602

HYDRAZINIUM SALTS OF MERCAPTOBENZOTHIAZOLE

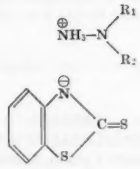
Adel F. Halasa, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 693,072, Dec. 26, 1967, abandoned, which is a continuation-in-part of Ser. No. 502,606, Oct. 22, 1965, abandoned. This application July 2, 1971, Ser. No. 159,464

Int. Cl. C07d *91/48*

U.S. Cl. 260—306 **2 Claims**

1. A compound



in which R_1 and R_2 are each either hydrogen or alkyl groups containing 1 to 12 carbon atoms or phenyl, tolyl, xylyl or naphthyl.

3,860,603

PROCESS FOR PREPARING 3-HYDROXY-ISOXAZOLE DERIVATIVE

Kennosuke Imamura; Toshio Kikuchi, both of Tokyo, and Shunichi Kanazawa, Chiba, all of Japan, assignors to Nippon Chemical Industrial Co., Ltd., Tokyo, Japan

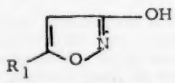
Filed Oct. 24, 1972, Ser. No. 300,089

Claims priority, application Japan, Oct. 23, 1971, 46-83679

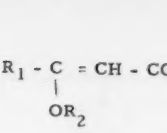
Int. Cl. C07d *85/22*

U.S. Cl. 260—307 H **3 Claims**

1. A process for preparing 3-hydroxyisoxazole compounds of the formula:



wherein R_1 represents a member selected from the group consisting of a hydrogen atom, C_1–C_4 alkyl, phenyl and phenyl substituted with a member selected from the group consisting of a halogen atom, nitro and C_1–C_4 alkyl, which comprises reacting in the presence of a solvent selected from the group consisting of H_2O, CH_3OH, C_2H_5OH, C_3H_7OH and mixtures thereof and at a temperature of from −20°C to 70°C, a compound of the formula:



wherein R_1 is defined as above, and R_2 and R_3 represent the same or different C_1–C_4 alkyl groups, with hydroxylamine in the presence of an alkali selected from the group consisting of an alkali metal hydroxide, ammonium hydroxide and an alkali metal salt of methane, subsequently treating the reaction product with an acid selected from the group consisting of HCl, H_2SO_4, or a mixture thereof, and then separating the acidified reaction product from the reaction system.

3,860,604

IMINOISOINDOLINONE DYESTUFFS

Ernst Model, Basel, and Sandor Gati, Birsfelden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

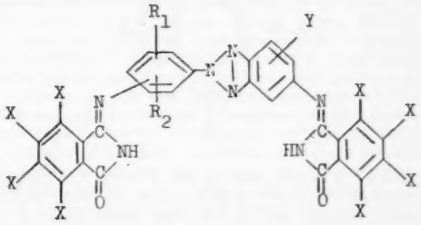
Filed Nov. 29, 1973, Ser. No. 420,117

Claims priority, application Switzerland, Dec. 5, 1972, 17657/70

Int. Cl. C07d *57/00*

U.S. Cl. 260—308 B **7 Claims**

1. An im..oisoindolinone dyestuff of the formula



wherein R_1, R_2 and Y denote hydrogen or halogen atoms or alkyl or alkoxy groups containing 1–4 carbon atoms and the X denotes halogen atoms.

3,860,605

N-(THIO)-HYDANTOINS

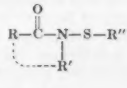
Aubert Yaucher Coran, and Joseph Edward Kerwood, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 29,717, March 27, 1970, Pat. No. 3,752,824, which is a division of Ser. No. 714,445, March 20, 1968, Pat. No. 3,546,185, which is a continuation-in-part of Ser. No. 579,493, Sept. 15, 1966, abandoned, and a continuation-in-part of Ser. No. 549,730, May 12, 1966, abandoned, and a continuation-in-part of Ser. No. 459,466, May 27, 1965, abandoned. This application Nov. 13, 1972, Ser. No. 306,172

Int. Cl. C07d *49/32*

U.S. Cl. 260—309.5 **10 Claims**

1. A compound of the formula



in which

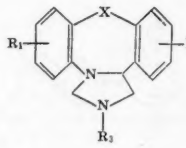
is
3-hydantoinyl, 5,5-dimethyl-3-hydantoinyl, 5,5-diphenyl-3-hydantoinyl, 1-(R''-S-)-3-hydantoinyl or 1-(R''-S-)-5,5-dimethyl-3-hydantoinyl and R'' is alkyl of 1–20 carbon atoms, phenyl, tolyl, naphthyl, benzyl or cycloalkyl of 5–12 carbon atoms.

3,860,606
TETRAHYDRO-IMIDAZO-DIBENZO-OXAZEPINES, THIAZEPINES AND-DIAZEPINES

Willem Jacob Van Der Burg, Heesch, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

Filed Mar. 2, 1973, Ser. No. 337,323
Claims priority, application Netherlands, Mar. 7, 1972, 7202963
Int. Cl. C07d *57/02*
U.S. Cl. 260—309.7 **4 Claims**

1. A compound of the formula:



in which X is oxygen, sulfur or NR_4, in which R_4 is hydrogen or alkyl of 1–6 carbon atoms; R_1 and R_2 are each hydrogen, halogen, hydroxy, alkyl of 1–6 carbon atoms, alkoxy of 1–6 carbon atoms or trifluoromethyl; R_3 is hydrogen, alkyl of 1–6 carbon atoms or phenylalkyl of 7–10 carbon atoms; or a pharmaceutically acceptable acid addition salt or a pharmaceutically acceptable quaternary ammonium compound thereof.

3,860,607
PROCESS FOR PREPARING HYDROXY-L-PROLINE OR N-ACETYL-HYDROXY-L-PROLINE FROM HYDROLYZED GELATIN

Onofrio Leonardo; Giacomo Giorgio, and Francesco Esposito, all of Naples, Italy, assignors to Richardson-Merrell S.p.A., Naples, Italy

Filed Dec. 15, 1972, Ser. No. 315,305
Claims priority, application Italy, Jan. 19, 1972, 47815/72
Int. Cl. C07d *27/04*
U.S. Cl. 260—326.2 **7 Claims**

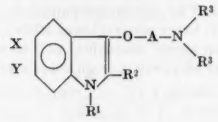
1. In a process of preparing hydroxy-L-proline and the N-acetyl derivative thereof starting from hydrolyzed animal gelatin solution the improvement, wherein the necessity for removing arginine from the hydrolyzed gelatin is eliminated, which comprises acetylating the hydrolyzed gelatin solution with acetic anhydride and an alkaline hydroxide at substantially neutral pH with stirring at a temperature of from 0° to 5°C., benzoylating the acetylated solution with benzoyl chloride and an alkaline hydroxide at substantially neutral pH with stirring at a temperature of from 0° to 5°C., separating the N-acetyl-O-benzoyl-hydroxy-L-proline from this benzoylated solution and then hydrolyzing the N-acetyl-O-benzoyl-hydroxy-L-proline in an alkaline medium to produce N-acetyl-hydroxy-L-proline or in an acidic medium to produce hydroxy-L-proline.

3,860,608
3-AMINOALKYLOXYINDOLES

Behrend Friedrich Lundt, Soborg, Denmark, assignor to Novo Terapeutisk Laboratorium A/S, Bagsvaerd, Denmark

Continuation-in-part of Ser. Nos. 39,863, May 22, 1970, abandoned, and Ser. No. 287,311, Sept. 8, 1972,. This application Nov. 10, 1972, Ser. No. 305,238
Claims priority, application Great Britain, May 27, 1969, 26683
Int. Cl. C07d *27/56*
U.S. Cl. 260—326.15 **9 Claims**

1. An indole compound having the structure:



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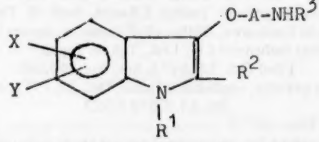
and the salts thereof with physiologically acceptable acids, in which
each of X and Y is selected from the group consisting of hydrogen, chlorine, lower alkyl having 1–3 carbon atoms and lower alkoxy having 1–3 carbon atoms,
R^1 is selected from the group consisting of hydrogen, lower alkyl having 1–4 carbon atoms and benzyl,
R^2 is selected from the group consisting of hydrogen, lower alkyl having 1–4 carbon atoms, benzyl and phenyl,
R^3 represents lower alkyl having 1–3 carbon atoms, or the two groups R^3 form together with the attached nitrogen atom a pyrrolidine of piperidine ring, and
A is an alkylene chain having 2 or 3 carbon atoms.

3,860,609
3-AMINOALKYLOXYINDOLES

Behrend Friedrich Lundt, Lyngby, Denmark, assignor to Novo Terapeutisk Laboratorium A/S, Bagsvaerd, Denmark

Continuation-in-part of Ser. Nos. 39,863, May 22, 1970, abandoned, and Ser. No. 201,550, May 20, 1970, , and Ser. No. 287,311, Sept. 8, 1972,. This application Nov. 10, 1972, Ser. No. 305,239
Claims priority, application Great Britain, May 27, 1970, 26683/70
Int. Cl. C07d *27/56*
U.S. Cl. 260—326.15 **10 Claims**

1. An indole compound having the structure:



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and the salts thereof with physiologically acceptable acids, in which
each of X and Y is selected from the group consisting of hydrogen, hydroxy, lower alkyl having 1–3 carbon atoms and lower alkoxy having 1–3 carbon atoms,
R^1 is selected from the group consisting of hydrogen, lower alkyl having 1–4 carbon atoms and benzyl,
R^2 is selected from the group consisting of hydrogen, lower alkyl having 1–4 carbon atoms, benzyl and phenyl,
R^3 is selected from the group consisting of hydrogen, lower alkyl having 1–8 carbon atoms, cycloalkyl having 5 or 6 carbon atoms, benzyl and 2-phenylethyl, and
A is a straight or branched alkylene chain containing from 2 to 4 carbon atoms.

3,860,610

SANDWICH-TYPE CHEMICAL COMPOUNDS AND METHOD FOR THEIR PREPARATION

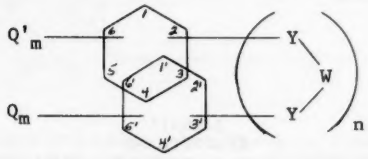
Earl Dan Flickinger, El Dorado, and Charles Merlyn Buess, Wichita, both of Kans., assignors to Skelly Oil Company, Tulsa, Okla.

Continuation of Ser. No. 68,047, Aug. 28, 1970, abandoned, which is a division of Ser. No. 706,663, Feb. 19, 1968, Pat. No. 3,577,431, which is a continuation-in-part of Ser. No. 554,651, June 2, 1966, abandoned. This application May 10, 1973, Ser. No. 359,126

Int. Cl. C07d *27/28*

U.S. Cl. 260—327 B 4 Claims

1. A compound having two benzene ring nuclei composed of six carbon atoms essentially superimposed in fixed parallel planes with respect to each other and having the formula



wherein

Y = CH_2;

W = S or SR^+X^-;

R = H or C_{1-4} alkyl;

X = Cl, Br or I;

n = 3 to 6;

Q,Q′ = H, OH, Cl or Br;

m = 0 to 3; and

$m + n$ = 3 to 6;

provided further that —Y—W—Y— groups are joined to corresponding positions on each ring (1,1′), (2,2′), (3,3′), (4,4′), (5,5′) and (6,6′).

3,860,611

MACROCYCLIC POLYETHER POLYOLS AND CONDENSATION POLYMERS DERIVED THEREFROM

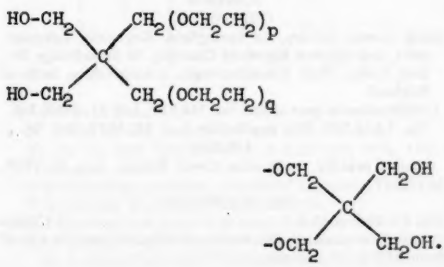
Carl G. Krespan, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 218,000, Jan. 19, 1972, Pat. No. 3,763,188. This application Aug. 16, 1973, Ser. No. 388,834

Int. Cl. C07d *19/00*

U.S. Cl. 260—338 8 Claims

1. A polyol having the formula



wherein p and q, alike or different, are from 1 to 9.

3,860,612

PREPARATION OF POLYCYCLIC KETONES

El Ahmadi I. Heiba, Princeton, and Ralph M. Dessau, Highland Park, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 828,342, May 27, 1969, abandoned, which is a continuation-in-part of Ser. No. 714,447, March 20, 1968, abandoned, and a continuation-in-part of Ser. No. 755,732, Aug. 27, 1968, abandoned, which is a continuation-in-part of Ser. No. 714,447, March 20, 1968,. This application Apr. 5, 1972, Ser. No. 241,380

Int. Cl. C07c *45/00*

U.S. Cl. 260—332.3 P 12 Claims

1. A method of preparing a polycyclic ketone, said polycyclic ketone having at least two rings, at least one of which is an aromatic ring and the other of which contains, as part of its ring structure, the carbom atom of a keto group, these two rings sharing two carbon atoms as part of their ring structure, said method comprising reacting an olefin selected from the group consisting of ethylene, propylene, n-butylene, isobutylene, pentene, hexene, heptene, octene, allene, butadiene, hexadiene, heptadiene, diisobutenyl, and hexatriene, or an acetylene selected from the group consisting of ethine, allylene, butyne, pentyne, hexyne, heptyne, octyne, butenyne, 1,6-heptadiene-3-yne, and 1,7-octaenyne with an aromatic ketone selected from the group consisting of phenyl methyl ketone, phenyl ethyl ketone, naphthyl methyl ketone, acetylanthracene, acetylpyridine, acetylfuran, and acetylthiophene in the presence of a metal ion of manganese, cerium, or vanadium in a higher valent form, said metal ion being provided by a compound of said metal selected from the group consisting of the acetates, propionates, butyrates, halides, and halogen-substituted acetates, -propionates, and -butyrates of said metal, said reaction being carried out with a concentration of said olefin or acetylene in the range from 0.10 to 5 molar, the amount of said olefin being from 0.25 to 1 mole per mole of metal ion, the amount of said aromatic ketone being at least 1 mole per mole of said olefin or acetylene, the temperature being between 40° and 100° C., and the pressure being such to maintain the reactants in the liquid phase.

3,860,613

PERFLUORALKYLMONOCARBOXYLIC ACID ESTERS

Horst Jaeger, Bettingen, Switzerland, assignor to Ciba-Geigy Corporation, Basel, Switzerland

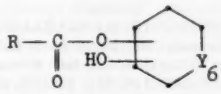
Filed June 26, 1970, Ser. No. 50,308

Claims priority, application Switzerland, July 7, 1969, 10350/69

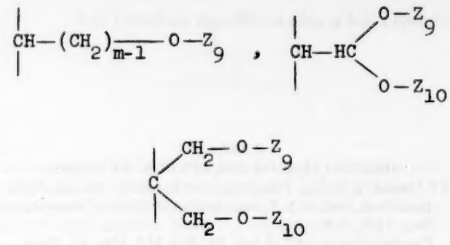
Int. Cl. C07c *69/62*; D06m *13/20*

U.S. Cl. 260—340.7 15 Claims

1. A perfluoralkylmonocarboxylic acid ester corresponding to the formula



wherein R is a perfluoralkyl radical with four to 14 carbon atoms, the perfluoralkylmonocarboxylic acid radical and the hydroxyl group are in the 3-4-position, or 4- and 3-position, to Y_6, and Y_6 represents a radical of formula



wherein Z_9 and Z_{10} each denote a hydrogen atom or an alkyl or hydroxyalkyl radical with one to five carbon atoms, and *m* denotes 1 or 2.

3,860,614

THERMOLYSIS OF STYRENE OXIDE

James M. Watson, Big Spring, Tex., assignor to Cosden Oil & Chemical Company, Big Spring, Tex.

Filed Feb. 26, 1973, Ser. No. 335,456

Int. Cl. C07d *13/00*; **C07c** *45/22*

U.S. Cl. 260—340.9 **22 Claims**

1. The process of thermolysis of styrene oxide comprising heating styrene oxide, without the utilization of a catalyst, at a temperature of between about 180° C and 450° C to obtain a reaction product comprising phenylacetaldehyde.

3,860,615

TRICYCLIC COMPOUNDS AND PROCESSES

Gerald Rey-Bellet, and Hans Spiegelberg, both of Basle, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

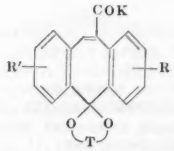
Division of Ser. No. 164,107, July 19, 1971, Pat. No. 3,726,870, which is a division of Ser. No. 759,499, Sept. 12, 1968, Pat. No. 3,631,103, which is a continuation-in-part of Ser. No. 431,981, Feb. 11, 1965, abandoned. This application Jan. 10, 1973, Ser. No. 322,600

Claims priority, application Switzerland, Feb. 18, 1964, 1969/64; Dec. 4, 1964, 15709/64

Int. Cl. C07d *13/04*

U.S. Cl. 260—340.9 **2 Claims**

1. A compound of the formula



wherein R and R′ are each independently selected from the group consisting of hydrogen and halogen; K is hydroxy and T is lower alkylene of 1–4 carbon atoms.

3,860,616

SYNTHESIS OF D,1-ZEARALANOL

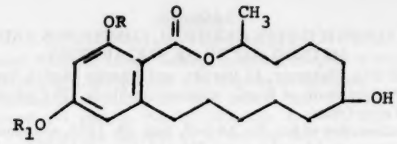
Robert D. Hoffsommer, and David Taub, both of Metuchen, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 821,139, May 1, 1969, abandoned. This application Nov. 29, 1972, Ser. No. 310,282

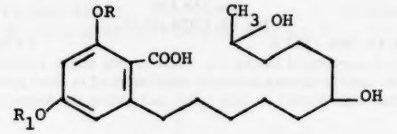
Int. Cl. C07d *9/00*

U.S. Cl. 260—343.2 F **3 Claims**

1. The process for preparing the compound having the formula:



wherein R is loweralkyl and R_1 is loweralkyl, that comprises treating the compound:



wherein R and R_1 are as defined above, with trifluoroacetic anhydride.

3,860,617

BENZOPYRANS

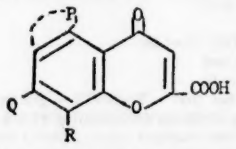
Hugh Cairns; Dennis Hunter, and John King, all of Loughborough, England, assignors to Fisons Limited, London, England

Filed Sept. 8, 1972, Ser. No. 287,546

Int. Cl. C07d *7/32*

U.S. Cl. 260—345.2 **10 Claims**

1. A compound of formula I,



I

in which Q and R, which may be the same or different, are each hydrogen or alkyl C 1 to 6 ,

P represents a 3 or 4 membered alkylene chain or a 2 or 3 membered alkylene chain interrupted or terminated by an oxygen atom, which chains are unsubstituted or are substituted by an alkyl C 1 to 6 substituent,

and pharmaceutically acceptable carboxylic acid salts, C 1 to 6 alkyl esters, esters of di C 1 to 6 alkyl amino substituted C 1 to 6 alkanols or pharmaceutically acceptable salts of such esters and unsubstituted amides thereof.

3,860,618

CHROMONE

Philip Saxton Hartley, 28 Springfield, Kegworth, Leicestershire, and Stephen Raymond Gunning, 50 Stonebridge Dr., East Leake, Near Loughborough, Leicestershire, both of England

Continuation-in-part of Ser. No. 748,937, July 31, 1968, Pat. No. 3,634,582. This application June 29, 1971, Ser. No. 158,059

Claims priority, application Great Britain, Aug. 8, 1967, 36270/67

Int. Cl. C07d *7/34*

U.S. Cl. 260—345.2 **2 Claims**

1. Sodium cromoglycate having an effective particle size of from 0.01 to 10 microns.

3,860,619

SULPHONYLUREA DERIVATIVES

Haldor Christensen, Tastrup; Behren M. Freidrich Lundt, Sborg; Frederick Christian Gronwald, Vedback, and William Andersen, Lyngby, all of Denmark, assignors to Novo Terapeutisk Laboratorium A/S, Bagsvaerd, Denmark

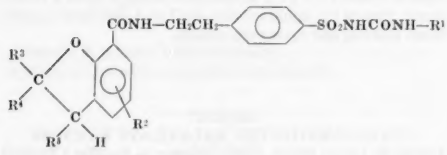
Continuation-in-part of Ser. No. 33,864, May 1, 1970, abandoned. This application Dec. 4, 1972, Ser. No. 311,973

Claims priority, application Great Britain, Aug. 27, 1969, 42763/69; Nov. 24, 1969, 57434/69

Int. Cl. C07d *5/40*

U.S. Cl. 260—346.2 R 14 Claims

1. A compound of the formula:



in which R^1 is n-butyl, cycloalkyl having five to eight ring carbon atoms, cyclohexenyl, 4-methylcyclohexyl, 4,4-dimethylcyclohexyl, 4-methoxycyclohexyl, 2,5-endomethylenecyclohexyl or 1,4-endoethylenecyclohexyl, R^2 is hydrogen or methoxy, methyl, bromine or chlorine in position four or in position five, R^3 represents methyl or hydrogen, R^4 and R^5 are each hydrogen or methyl but not both methyl at the same time, or R^4 and R^5 may together represent the additional bond between the 2 and 3 position carbons of a benzo(b)furan ring, and its pharmaceutically acceptable alkali metal salts.

3,860,620

BASIC ANTHRAQUINONE DYESTUFFS

Gert Hegar, Schoenenbuch, and Visvanathan Ramanathan, Basel, both of Switzerland, assignors to Ciba-Geigy AG, Basil, Switzerland

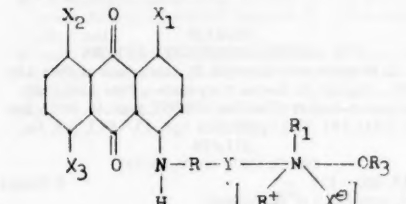
Division of Ser. No. 717,011, March 28, 1968, Pat. No. 3,627,751. This application July 15, 1971, Ser. No. 163,086

Claims priority, application Switzerland, Apr. 4, 1967, 4743/67

Int. Cl. C09b *1/28, 1/32;* C01b *1/50*

U.S. Cl. 260—378 4 Claims

1. A dyestuff of the formula



in which

n is 1 or 2,

X_1 is NH_2 or OH,

X_2 and X_3 each independently is hydrogen, NH_2, OH or NO_2,

R is methylene, ethylene, phenylene, toluylene

Y is alkylene of at most 4 carbon atoms,

R_1 is hydrogen or alkyl of at most 3 carbon atoms,

R_2 is hydrogen, alkyl of at most 3 carbon atoms or benzyl,

R_3 is alkyl of at most 3 carbon atoms, benzyl or cyclohexyl, and

X^- is an anion.

3,860,621

METHOD OF RECOVERY OF A FUCHSINE SALT

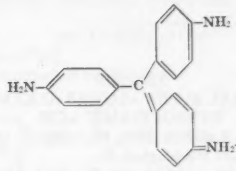
Frank Hollister Turrill, Huntington, W. Va.; Lyle Eli Squire, Winterhaven, Fla., and Jack Lewis Towle, Holland, Mich., assignors to Chemetron Corporation, Chicago, Ill.

Filed Jan. 2, 1973, Ser. No. 320,540

Int. Cl. C09b *11/12*

U.S. Cl. 260—391 9 Claims

1. A method of recovery of a salt having the formula:



wherein A is a chloride or nitrate ion, from a mixture containing said salt and aniline; said method comprising the steps of adjusting the pH of said mixture to form about 4 to about 7.5, dehydrating the mixture to substantial dryness, precipitating the salt by adding at least one solent-precipitant selected from the class consisting of hydrocarbons, chlorinated hydrocarbons, alcohols, ethers, and pyridines to the mixture and separating the precipitate from the mother liquor at a temperature below the decomposition temperature of the mixture.

3,860,622

ORGANOTITANATE-BORATE COMPLEXES

Robert C. Wade, Ipswich, Mass., assignor to Ventron Corporation, Beverly, Mass.

Filed June 4, 1973, Ser. No. 366,729

Int. Cl. C07f *7/28*

U.S. Cl. 260—429.5 13 Claims

1. The method of preparing a complex of the general formula $Ti(OR)_4{\cdot}B(OR')_3$ where R and R' are alkyl groups which consists in mixing equimolar amounts of a tetraalkyl titanate containing from 12 to 72 carbon atoms with a trialkyl borate containing from 3 to 18 carbon atoms, and stirring the mixture until substantially all the trialkyl borate has reacted with the tetraalkyl titanate to form said complex.

3,860,623

PRODUCTION OF ISOCYANATES

Fritz Zanker, Worms, and Dietrich Mangold, Neckargemuend, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Rheinland-Pfalz, Germany

Filed Feb. 14, 1973, Ser. No. 332,291

Claims priority, application Germany, Mar. 3, 1972, 2210285

Int. Cl. C07c *119/04*

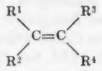
U.S. Cl. 260—453 P 7 Claims

1. In a process for producing an isocyanate of the formula $R{-}N{=}C{=}O$,

where R denotes alkyl of 1 to 12 carbon atoms, alkynyl of 2 to 6 carbon atoms, cycloalkyl of 5 to 8 carbon atoms to which a 5-or 6-membered alicyclic hydrocarbon ring may be fused via 2 or 3 common carbon atoms, alkyl of 1 to 6 carbon atoms substituted by cycloalkyl of 5 to 6 carbon atoms to which a 5- or 6-membered alicyclic hrdrocarbon ring may be fused via 2 or 3 common carbon atoms, aralkyl of 7 to 12 carbon atoms, phenyl, naphthyl or the same radicals bearing substituents which are inert under the reaction conditions, by eliminating hydrogen halide from a carbamyl halide of the formula

R—NH—CO—X,

where R has the above meanings and X denotes bromine or chlorine, which comprises carrying out the reaction in the presence of a hydrogen halide binding agent consisting essentially of an olefin of the formula



where R^1, R^2, R^3 and R^4 are identical or different and each denotes hydrogen or alkyl of 1 to 4 carbon atoms.

3,860,624

P-CYCLOHEXYL ALPHA - LOWER ALKANOYLTHIO HYDROCINAMIC ACID

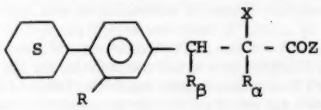
Julius Diamond, Lafayette Hills, Pa., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 164,822, July 21, 1971. This application July 12, 1973, Ser. No. 380,651

Int. Cl. C07c *153/07*

U.S. Cl. 260—455 R **9 Claims**

1. A compound of the formula



in which

R is halo,

X is lower alkanoylthio,

R_{301} and R are hydrogen or lower alkyl, and

Z is —OH or —OM, where M is an alkali or alkaline earth salt.

3,860,625

ETHOXYLATED HYDROCARBYL BUTANEDIOLS AND THEIR DISULFATE DERIVATIVES AS PHOSPHATE-FREE COMPOSITIONS

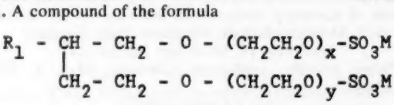
Robert G. Anderson, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 10, 1969, Ser. No. 798,162

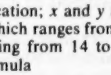
Int. Cl. C07c *141/02*

U.S. Cl. 260—458 **4 Claims**

1. A compound of the formula



wherein M is hydrogen, or an alkali metal, alkaline earth metal, or ammonium cation; *x* and *y* are independent whole numbers, the sum of which ranges from 1 to 10; R_1 is an alkyl or alkenyl radical having from 14 to 36 carbon atoms and represented by the formula



wherein R_2 and R_3 are hydrogen, alkyl or alkenyl radicals of 0 to 35 carbon atoms, and the sum of carbon atoms in R_2 and R_3 is from 13 to 35.

3,860,626

METHODS FOR THE PREPARATION OF BOROTRIHYDROXYGLUTARATE

Aina Yanovna Putnin; Evgenia Mikhailovna Shvarts; Nina Avgustovna Ermush; Alfred Fritsevich Ievinsh, and Arvid Yanovich Kalninsh, all of Riga, U.S.S.R., assignors to Institut Neorganicheskoi Khimii, Riga, U.S.S.R.

Filed July 25, 1968, Ser. No. 747,475

Claims priority, application U.S.S.R., July 26, 1967, 1174906

Int. Cl. C07f *5/04*

U.S. Cl. 260—462 R **4 Claims**

1. A method for producing non-toxic crystals of sodium borotrihydroxyglutarate which comprises mixing trihydroxyglutaric acid, boric acid and sodium hydroxide in the molar ratio of about 1.1 : 1 : 2 in sufficient water to form a syrupy liquid, stirring the liquid mixture for 2 to 3 days until crystals form, filtering and drying the crystals.

3,860,627

CYANO SUBSTITUTED MALANILATE BIOCIDES

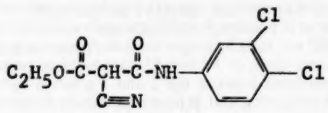
George B. Large, Pinole, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 9, 1973, Ser. No. 339,791

Int. Cl. C07c *121/78*

U.S. Cl. 260—465 D **1 Claim**

1. A compound having the following formula:



3,860,628

CYANOMETHYL(3-TRIFLUOROMETHYLPHENOXY)(4-HLOROPHENYL)ACETATE

Richard F. Shuman, Westfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed July 13, 1972, Ser. No. 271,447

Int. Cl. C07c *121/74*

U.S. Cl. 260—465 D **1 Claim**

1. Cyanomethyl (3-trifluoromethylphenoxy) (4-chlorophenyl)acetate.

3,860,629

CYCLOPROPANEMETHYL ESTERS

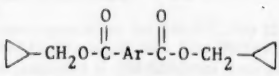
Clive A. Henrick, and Gerardus B. Staal, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 289,897, Sept. 18, 1972, Pat. No. 3,816,501. This application Apr. 13, 1973, Ser. No. 351,028

Int. Cl. C07c *69/76, 69/82*

U.S. Cl. 260—470 **9 Claims**

1. A compound of the formula



wherein Ar is an aromatic hydrocarbon ring of six to twenty carbon atoms or two phenyl or naphthyl rings joined by a direct bond or by an atom of oxygen, sulfur or nitrogen, said group Ar being optionally substituted by one or two groups selected from methyl, ethyl, halogen, or nitro.

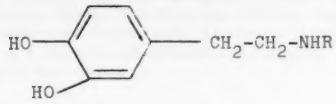
3,860,630

PHENETHYLAMIDE DERIVATIVES

Ado Kaiser, Neu-Frenkendorf; Wolfgang Koch, Riehen; Marcel Scheer, Basel, and Uwe Wolcke, Bottmingen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 187,118, Oct. 6, 1971, Pat. No. 3,793,342.
This application Sept. 13, 1973, Ser. No. 396,920
Int. Cl. C07c *125/06*
U.S. Cl. 260—471 C 6 Claims

1. Compounds of the general formula



wherein R is lower t-alkoxycarbonyl
or pharmaceutically acceptable salts thereof.

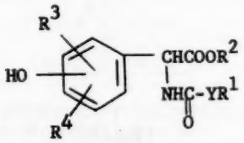
3,860,631

PROCESS FOR THE PREPARATION OF N-ACYL-2-AND 4-HYDROXYPHENYLGLYCINES

John G. Gleason, Cornwall Heights, Pa.; Kenneth G. Holden, Haddonfield, N.J., and Nelson C. F. Yim, Philadelphia, Pa. assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Dec. 6, 1973, Ser. No. 422,398
Int. Cl. C07c *125/06*
U.S. Cl. 260—471 C 8 Claims

1. A process for preparing an ortho or para-hydroxy compound of the formula:



in which:

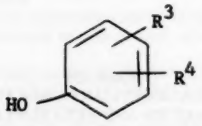
Y is O, S, NH or a carbon-carbon single bond;

R^1 is hydrogen, except when Y is O or S; lower alkyl of from one to five carbon atoms; trichloroethyl; trifluoromethyl, when Y is a carbon-carbon single bond; phenyl; benzyl; benzhydryl or α-phenethyl;

R^2 is hydrogen, lower alkyl of from one to five carbon atoms, benzyl, benzhydryl, menthyl, 2-octyl or trichloroethyl; and

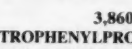
R^3 and R^4 are each hydrogen, lower alkyl or lower alkoxy of from one to five carbon atoms, hydroxy, halo, acetamido or nitro,

comprising reacting a phenol of the formula



with a glyoxylic acid or ester of the formula

$OHCCOOR^2$, where R^2 is as defined above, and an amide, thiocarbamate, carbamate or urea of the formula



where Y and R^1 are as defined above.

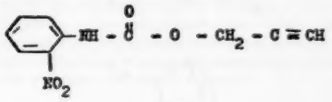
3,860,632

N-O-NITROPHENYLPROPARGYL-CARBAMATE

Henry Martin, Basel, Switzerland; Georg Pissiotas, Loerrach, Germany, and Otto Rohr, Therwil, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 69,887, Sept. 4, 1970, Pat. No. 3,800,037.
This application Jan. 2, 1974, Ser. No. 430,284
Claims priority, application Switzerland, Sept. 4, 1969, 13420/69
Int. Cl. C07c *125/06*
U.S. Cl. 260—471 C 1 Claim

1. The compound of the formula



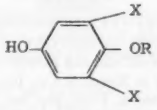
3,860,633

3,5-DIHALO-4-CARBOXYALKOXY PHENOLS AND ESTERS THEREOF

Linneaus C. Dorman, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 839,133, June 11, 1969, Pat. No. 3,709,939, which is a division of Ser. No. 563,719, July 8, 1966, Pat. No. 3,468,926. This application Oct. 24, 1972, Ser. No. 299,883
Int. Cl. C07c *65/00, 69/76*
U.S. Cl. 260—473 G 9 Claims

1. A compound of the formula



wherein each X is F, Cl or Br and R is a lower alkyl group bearing as a substituent a carboxyl or carbalkoxy group.

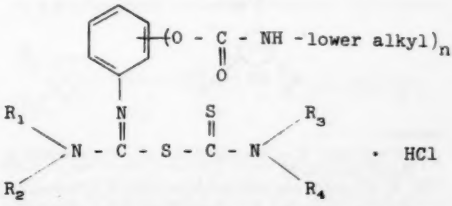
3,860,634

DITHIOCARBAMATE HYDROCHLORIDE SALTS AND THEIR MANUFACTURE

John F. Olin, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 160,556, July 7, 1971, abandoned. This application July 24, 1973, Ser. No. 382,259
Int. Cl. C07c *69/00*
U.S. Cl. 260—479 C 4 Claims

1. A compound of the formula



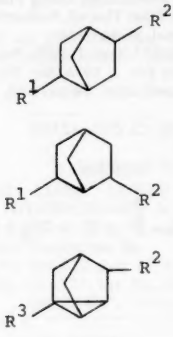
wherein R_1, R_2, R_3 and R_4 are each lower alkyl and *n* is an integer from 1 to 3.

3,860,635
SUBSTITUTED NORBORNYL AND NORTRICYCLYL DERIVATIVES AND THEIR USE IN PERFUMERY

Garry C. Kitchens, Wayne, N.J., assignor to Givaudan Corporation, Clifton, N.J.

Filed Oct. 6, 1969, Ser. No. 864,158
Int. Cl. C07c *35/22, 35/28, 69/14, 69/06, 69/24*
U.S. Cl. 260—488 B 11 Claims

1. A compound having the formula:



wherein

R^1 is an ethylidene radical;

R^2 is a member selected from the group consisting of an acyloxy radical derived from an alkanoic acid containing up to 5 carbon atoms, and a hydroxyl radical.

R^3 is an ethyl group;

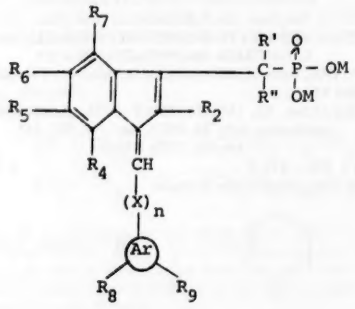
and mixtures of said compounds.

3,860,636
SUBSTITUTED INDENYL PHOSPHONIC ACIDS HAVING ANTI-INFLAMMATORY ACTIVITY

Tsung-Ying Shen, Westfield, and Howard Jones, Holmdel, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 6, 1972, Ser. No. 312,549
Int. Cl. C07f *9/38*; A61k *29/00*
U.S. Cl. 260—502.4 R 3 Claims

1. A compound of the formula



wherein:

R_2 is hydrogen, C_{1-5} loweralkyl or C_{1-5} chloro, bromo or fluoro loweralkyl;

R_4, R_5, R_6 and R_7 are each hydrogen, halo, C_{1-5} loweralkyl, halo C_{1-5} loweralkyl, C_{1-5} loweralkoxy, nitro, amino, C_{1-5} loweralkylamino, C_{1-5} diloweralkylamino, C_{1-5} loweralkanoyloxy, C_{1-5} loweralkanoylamino, hydroxy, C_{1-5} loweralkanoyl, C_{2-5} loweralkenoyl, C_{2-5} loweralkenyloxy or trifluoromethyl;

R_8 and R_9 are each hydrogen, chloro, bromo, fluoro, C_{1-5} loweralkythio, C_{1-5} loweralkyl, trifluoromethyl, C_{1-5} loweralkylsulfonyl, C_{1-5} loweralkylsulfinyl, C_{1-5} diloweralkylsulfamyl, nitro or C_{1-5} loweralkoxy;

X is C_{1-4} alkylene, C_{2-4} alkenylene, C_{2-4} alkynylene or —O—;

Ar is phenyl;

R′ and R″ are each hydrogen or C_{1-5} *loweralkyl*;

n is 0 or 1; and *m* is hydrogen

3,860,637
SELECTIVE MANUFACTURE OF 4,4′-ISOMER OF DIAMINODIPHENYL-METHANE

Floyd Edward Bentley, Austin, Tex., assignor to Jefferson Chemical Company, Inc., Houston, Tex.

Filed Jan. 26, 1971, Ser. No. 109,979
Int. Cl. C07c *85/08*
U.S. Cl. 260—570 D 2 Claims

1. In a process wherein aniline is reacted with formaldehyde to produce diaminodiphenylmethane containing greater than 10 percent by weight of the 2,2′ and 2,4′ isomers thereof and polyamines with functionality greater than two the improvement which comprises

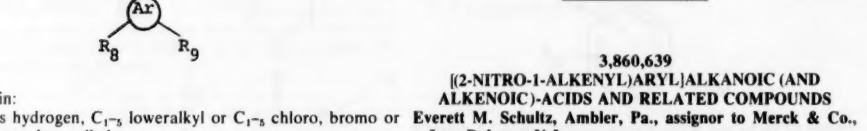
recycling a stream consisting essentially of all or a portion of the 2,2′ and 2,4′ isomers of diaminodiphenylmethane to the aniline-formaldehyde feed so that there is little or no net make of the 2,2′ and 2,4′ isomers of diaminodiphenylmethane and less than 10 percent by weight of the 2,2′ and 2,4′ isomers in the diamine fraction of the product.

3,860,638
BRIGHT NICKEL PLATING BATH ADDITION AGENTS

Sidney C. Beach, and Bernard P. Martin, both of Cleveland, Ohio, assignors to Inorganic & Metal Treating Chemicals Division, Chemetron Corporation

Division of Ser. No. 145,474, May 20, 1971, Pat. No. 3,699,016, which is a continuation-in-part of Ser. No. 592,742, Nov. 8, 1966, abandoned, which is a continuation-in-part of Ser. No. 860,008, Sept. 22, 1969, abandoned. This application June 30, 1972, Ser. No. 268,039
Int. Cl. C07c *143/16*
U.S. Cl. 260—513 R 1 Claim

1. A new composition of matter having the following structural formula

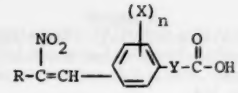


3,860,639
[(2-NITRO-1-ALKENYL)ARYL]ALKANOIC (AND ALKENOIC)-ACIDS AND RELATED COMPOUNDS

Everett M. Schultz, Ambler, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed June 22, 1970, Ser. No. 48,459
Int. Cl. C07c *79/46*
U.S. Cl. 260—515 R 5 Claims

1. A compound of the formula:



wherein R is lower alkyl, lower alkoxy lower alkyl, halo lower alkyl, trihalo lower alkyl, hydroxy lower alkyl, cyano, benzyl or lower cycloalkyl; X is hydrogen, halo or lower alkyl or, taken together, two X radicals on the 5 and 6 carbon atoms of the benzene ring may be joined to form the 1,3-butadienylene linkage; Y is methylene, ethylene, vinylene or methyl substituted vinylene and n is an integer having a value of 1–4, or a non-toxic, pharmaceutically acceptable salt or a lower alkyl ester thereof.

3,860,640

3-ALKOXY-5-SUBSTITUTED PHENYLACETIC ACIDS

Yasumitsu Tamura, Takarazuka; Masao Murayama; Eisuke Seto, both of Kyoto; Yoshihiko Yoshimoto, Shiga, and Hisayuki Wada, both of Kyoto, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Kyoto, Japan

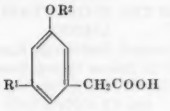
Filed Mar. 23, 1973, Ser. No. 344,098

Claims priority, application Japan, Apr. 12, 1972, 47-36774; Apr. 12, 1972, 47-36775

Int. Cl. C07d *63/54;* **A61k** *27/00*

U.S. Cl. 260—520 **10 Claims**

1. A compound of the formula



wherein R^1 is phenyl or phenyl substituted by halogen, lower alkoxy or lower alkyl and R^2 is lower alkyl.

3,860,641

PROCESS FOR THE PRODUCTION OF THIOGLYCOLIC ACID, BETA-MERCAPTOPROPIONIC ACID OR SALTS THEREOF

Hans Georg Zengel, Kleinwallstadt, and Manfred Bergfeld, Erlenbach, both of Germany, assignors to Akzo N.V., Arnhem, Netherlands

Filed Oct. 9, 1973, Ser. No. 404,483

Claims priority, application Germany, Oct. 21, 1972, 2251717

Int. Cl. C07c *149/06*

U.S. Cl. 260—526 S **12 Claims**

1. A process for the production of thioglycolic acid, β-mercaptopropionic acid or salts thereof, which process comprises:

reacting a hydrogen sulfide of the formula MHS, where M is an alkali or alkaline earth metal, with a xanthogenic acid ester of the formula

$$R'O—CS—S(CH_2)_n—COOM',$$

where R′ is alkyl of 1 to 5 carbon atoms, *n* is an integer of 1 or 2 and M′ is hydrogen or an alkali or alkaline earth metal, said reaction being carried out at a temperature of approximately 10° to 100°C. in a lower alkanol as the reaction medium.

3,860,642

METAL-CHELATE CATALYZED OXIDATION OF MONOSACCHARIDES AND DERIVATIVES THEREOF

Thomas F. Rutledge, Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.

Filed Dec. 4, 1972, Ser. No. 311,495

Int. Cl. C07c *51/26, 51/27*

U.S. Cl. 260—528 **9 Claims**

1. A method of oxidizing a compound selected from the group consisting of monosaccharides containing at least 4 carbon atoms, polyhydric alcohol derivatives of said monosaccharides and polyhydric acid derivatives of said monosaccharides, said method comprising contacting an aqueous solution of the compound, the temperature of the solution being equal to from room temperature to about 90°C., with oxygen or an oxygen containing gas, an alkaline material in an amount sufficient to maintain the pH of the solution in the range of from about 6 to about 9, and a catalyst selected from the group consisting of copper glycinate, copper acetylacetonate, copper phthalocyanine disulfonate, copper phthalocyanine, copper glutamate, copper diethylene tetramine pentaacetate, cobalt glutamate, cobalt acetylacetonate, cobalt trisodium diethylene tetramine pentaacetate and cobalt disodium ethylene diamine tetraacetate wherein the terms copper and cobalt refer to the cobaltous and cupric materials.

3,860,643

COMPOSITIONS OF MATTER

Sidney B. Richter, Chicago, and John Krenzer, Oak Park, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Aug. 15, 1968, Ser. No. 752,797

Int. Cl. C07c *127/22*

U.S. Cl. 260—545 R **4 Claims**

1. 1-(4′-methoxyphenylcarbonyloxy)-1-(3″,4″-dichlorophenyl)-3-methylurea.

3,860,644

NEW COMPOSITIONS OF MATTER

John Krenzer, Oak Park, and Sidney B. Richter, Chicago, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed July 30, 1970, Ser. No. 59,706

Int. Cl. C07c *127/20*

U.S. Cl. 260—545 R **2 Claims**

1. 1-(3,4-dibromophenyl)-1-[(α-2-chlorophenoxy)-α-ethylbutyroxy]-3-methylurea.

2. 1-(2-nitro-3-chloroethylphenyl)-1-[(α-2-methyl-4-bromophenoxy)propionoxy]-3-pentylurea.

3,860,645

BACTERIOSTATIC SUBSTITUTED CARBANILIDES

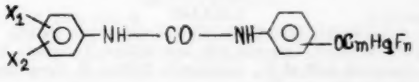
Edward Nikawitz, Glen Rock, N.J., assignor to Givaudan Corporation, Clifton, N.J.

Filed May 23, 1973, Ser. No. 363,206

Int. Cl. C07c *127/16*

U.S. Cl. 260—553 C **7 Claims**

1. A polyfluoralkoxy carbanilide compound of the structure



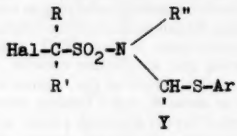
where X_1 and X_2 are selected from the group consisting of Cl and H, at least one of X_1 and X_2 being Cl, *m* is an integer from 1 to 3, *q* is an integer from 0 to 5, *n* is an integer from 2 to 7 and the positions ortho to the nitrogen atom in the phenyl moieties are unsubstituted.

3,860,646
HALOGENOALKANESULFONIC ACID AMIDES

Claus Stolzer, Wuppertal; Ingeborg Hammann, Cologne, and Gunther Unterstenhofer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 3, 1973, Ser. No. 347,537
Claims priority, application Germany, Apr. 11, 1972, 2217245
Int. Cl. C07c *143/74*
U.S. Cl. 260—556 A 9 Claims

1. A halogenoalkanesulfonic acid amide of the formula



(I)

in which

R and R′ each independently is hydrogen, halogen, alkyl of up to 6 carbon atoms, or halogen-substituted alkyl of up to 6 carbon atoms,

Hal is halogen,

R″ is hydrogen, alkyl of up to 6 carbon atoms or lower alkenyl,

Y is hydrogen or trichloromethyl, and

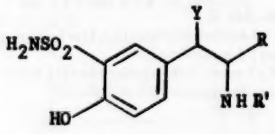
Ar is phenyl, naphthyl, benzyl or phenylethyl, optionally substituted by fluorine, chlorine, bromine, nitro, nitrile, trifluoromethyl, trichloromethyl, lower alkyl, lower alkoxy, lower alkylmercapto or lower alkenyl.

3,860,647
α-AMINOMETHYL-4-HYDROXY-3-SULFAMYL-BENZYL ALCOHOLS AND 4-HYDROXY-3-SULFAMYL PHENETHYLAMINES

Donald F. Colella, West Norriton, Pa., and Carl Kaiser, Haddon Heights, N.J., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Aug. 20, 1973, Ser. No. 389,772
Int. Cl. C07c *143/80*
U.S. Cl. 260—556 AR 9 Claims

1. A compound of the formula



where

R is hydrogen or alkyl of C_1–C_4;

R′ is alkyl of C_1–C_6, cycloalkyl of C_3–C_6, $XC_6H_4(CH_2)$-$CH(CH_3)$, $XC_6H_4CH_2CH(CH_3)$, $XC_6H_4CH_2C(CH_3)_2$, or $XC_6H_4(CH_2)_2C(CH_3)_2$.

X is hydrogen, hydroxy, or methoxy; and

Y is hydrogen or hydroxy, or a nontoxic pharmaceutically acceptable salt thereof.

3,860,648
1-(P-TRIFLUOROMETHOXYPHENYL)-BIGUANIDE

Julius Diamond, Lafayette Hill, and William J. Novick, Jr., Gwynedd, both of Pa., assignors to William H. Rorer Inc., Fort Washington, Pa.

Division of Ser. No. 15,967, March 2, 1970,. This application Feb. 12, 1974, Ser. No. 441,907
Int. Cl. C07c *129/08*
U.S. Cl. 260—565 1 Claim

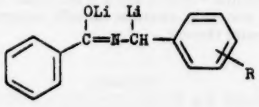
1. 1-(p-Trifluoromethoxyphenyl) biguanide or a salt thereof of a pharmaceutically acceptable acid.

3,860,649
LITHIATED N-BENZYL BENZAMIDES

William J. Houlihan, Mountain Lakes, and Jeffrey Nadelson Lake Parsippany, both of N.J., assignors to Sandoz Wander, Inc., Hanover, N.J.

Division of Ser. No. 247,545, April 26, 1972, Pat. No. 3,787,495. This application Sept. 21, 1973, Ser. No. 399,430
Int. Cl. C07c *119/00*
U.S. Cl. 260—566 F 1 Claim

1. A compound of the formula



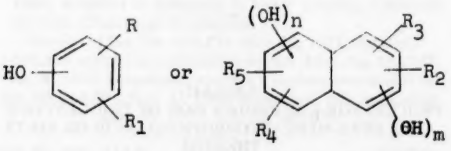
where R is a hydrogen atom or halo of atomic weight from about 19 to about 36.

3,860,650
PROCESS FOR THE PRODUCTION OF ORGANIC AMINES

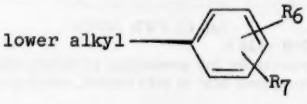
Mitchell Becker, Teaneck, and Sargis Khoobiar, Clifton, both of N.J., assignors to Halcon International, Inc.

Filed May 27, 1969, Ser. No. 828,333
Int. Cl. C07c *85/02*
U.S. Cl. 260—570 D 9 Claims

1. A process for preparing an organic amine from an organic alcohol selected from the group consisting of a compound of the formula



wherein *n* and *m* are numbers from zero to 2, only one of said *n* and *m* being zero at any one time, R and R_1-R_5 are hydrogen, hydroxy, lower alkyl, lower alkoxy, phenyl, phenyl lower alkyl, substituted phenyl lower alkyl of the formula



wherein R_6 and R_7 are hydrogen, hydroxy, lower alkoxy, only one of said R_6 and R_7 being hydrogen at any one time, and substituted phenyl containing substituents R_6 and R_7 as above, comprising the steps of: reacting ammonia and said alcohol in the presence of a catalyst consisting essentially of alumina derived from a precipitated gel form, having a surface area of at least 150 sq. meters per gram and having an alkali metal content, expressed as alkali metal oxide, of not more than 1.0 percent by weight.

3,860,651

REDUCTIVE ALKYLATION OF AMINES

Robert J. Adamski, and Satoru Numajiri, both of Fort Worth, Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 868,904, Oct. 23, 1969, abandoned. This application May 24, 1972, Ser. No. 256,340

Int. Cl. C07c *91/22*

U.S. Cl. 260—570.6 1 Claim

1. A catalytic hydrogenation process for the reductive alkylation of an alcohol amine selected from the group consisting of 1-(4-hydroxyphenyl)-2-amino ethanol and 1-(3-hydroxyphenyl)-2-amino ethanol, said alcohol amine being in the form of its hydrochloride salt, which comprises dissolving the hydrochloride salt of said alcohol amine in an anhydrous organic solvent and reacting said hydrochloride salt of said alcohol amine in a reaction medium made up of said salt and said anhydrous organic solvent and a ketone selected from the group consisting of acetone and cyclohexanone and in the absence of water at a temperature in the range from about 30°C. to about 60°C. in the presence of gaseous hydrogen at a pressure of about 50 psig and a catalyst consisting essentially of palladium on charcoal.

3,860,652

8-AMINOALKYL SUBSTITUTED DIBENZOBICYCLO [3.2.1] OCTADIENES

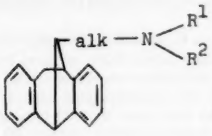
Walton James Hammar, Saint Paul, Minn., assignor to Riker Laboratories, Inc., Northbridge, Calif.

Filed Oct. 29, 1971, Ser. No. 194,056

Int. Cl. C07c *87/28*

U.S. Cl. 260—570.9 14 Claims

1. A compound of the formula



wherein R^1 is hydrogen or lower alkyl, R^2 is lower alkyl and -alk- is methylene, ethylene or methylmethylene; and acid addition salts thereof.

3,860,653

SUBSTITUTED 2-(PHENYL)-CYCLOHEXANONES

Joseph Hellerbach, Basel, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

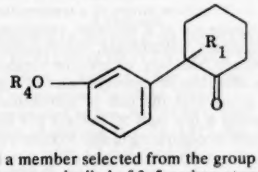
Division of Ser. No. 869,936, Oct. 27, 1969, , which is a continuation-in-part of Ser. No. 559,739, June 23, 1966, Pat. No. 3,499,901. This application Sept. 1, 1972, Ser. No. 285,948

Claims priority, application Switzerland, June 30, 1965, 9168/65

Int. Cl. C07c *49/82*

U.S. Cl. 260—590 2 Claims

1. A compound of the formula



wherein R_1 is a member selected from the group consisting of lower alkyl, lower cycloalkyl of 3–5 carbon atoms-substituted lower alkyl, wherein said lower cycloalkyl-substituted lower alkyl moiety contains no more than 7 carbon atoms, and lower alkenyl; and R_4 is a member selected from the group consisting of lower alkyl, hydroxy-substituted lower alkyl, lower alkoxy-substituted lower alkyl and benzyl.

3,860,654

PRODUCTION OF 6,10-DIMETHYLUNDECATRIENE-(3,5,10)-ONE-(2)

Horst Pommer; Werner Reif; Heinrich Pasedach, and Werner Hoffmann, all of Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Rheinland-Pfalz, Germany

Continuation-in-part of Ser. No. 702,202, Feb. 1, 1968, abandoned. This application Sept. 23, 1970, Ser. No. 74,939

Claims priority, application Germany, Feb. 4, 1967, 1286019

Int. Cl. C07c *49/20*

U.S. Cl. 260—595 2 Claims

1. A process for the production of 6,10-dimethylundecatriene-(3,5,10)-one-(2) which comprises

reacting 3,7-dimethylocten-(7)-yn-(1)-ol-(3) with diketene to form 3,7-dimethylocten-(7)-yn-(1)-ol-(3) acetoacetate,

decomposing the 3,7-dimethylocten-(7)-yn-(1)-ol-(3) acetoacetate obtained by heating at a temperature of from 100° to 400°C. and aftertreating the decomposition product by heating at from 100° to 400° in the presence of about 0.01 to 10% by weight, with reference to the starting material, of an acid catalyst selected from the group consisting of acetic acid, valeric acid, adipic acid, benzoic acid, phthalic acid, isophthalic acid, terephthallic trimellitic acid and pyromellitic acid.

3,860,655

PRODUCTION OF 6,10-DIMETHYLUNDECATRIEN-(3,5,10)-ONE-(2)

Horst Pommer; Werner Reif; Heinrich Pasedach, and Werner Hoffmann, all of Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Rheinland-Pfalz, Germany

Continuation-in-part of Ser. No. 701,536, Jan. 30, 1968, abandoned. This application Nov. 20, 1970, Ser. No. 91,571

Int. Cl. C07c *45/18*

U.S. Cl. 260—595 5 Claims

1. A process for the production of 6,10-dimethylundecatrien-(3,5,10)-one-(2) which comprises reacting 3.7-dimethylocten-(7)-yn-(1)-ol-(3) with a lower alkanol ester of acetoacetic acid at a temperature of from 100° to 400°C. and treating the reaction mixture with about 0.01 to 10 percent by weight, with reference to the starting material, of a catalyst consisting essentially of an organic acid selected from the class consisting of acetic acid, adipic acid, benzoic acid, phthalic acid, isophthalic acid, terephthalic acid, trimellitic acid and pyromellitic acid at a temperature of from 100° to 400°C.

3,860,656

PURIFICATION OF GLYOXAL

James Herndon McCain, Jr., and Louis Foster, both of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 8, 1972, Ser. No. 261,019

Int. Cl. C07c *47/12*

U.S. Cl. 260—601 R 5 Claims

1. A process for the purification of crude, aqueous solutions of glyoxal which comprises contacting said aqueous solutions with a countercurrent flow of an organic solvent solution containing from about 5 to about 50 weight percent of a high molecular weight tertiary amine or a quarternary ammonium salt thereof in bicarbonate form, wherein said organic solvent is a liquid selected from the group consisting of lower alkyl alkanoates, phenyl alkanoates, lower dialkyl ethers, lower dialkyl ketones, alkanes, monocyclic aromatic hydrocarbons, and said high molecular weight unsubstituted aliphatic satu-

rated or olefinically unsaturated tertiary amine or quarternary ammonium salt thereof in bicarbonate form having at least 17 carbon atoms per nitrogen atom and being essentially water insoluble and organic solvent soluble, at a temperature of from 0°C. to 100°C. for a period of time sufficient to decrease the acid impurities content of said aqueous glyoxal solution and recovering deacidified glyoxal solution of lowered acid content.

3,860,657

PROCESS FOR THE PREPARATION OF CITRONELLAL

William M. Easter, Jr., Hasbrouck Heights; Julian Dorsky, Rockaway, and Robert F. Tavares, Cedar Grove, all of N.J., assignors to Givaudan Corporation, Clifton, N.J.

Filed Mar. 25, 1970, Ser. No. 22,658
Int. Cl. C07c *47/20*
U.S. Cl. 260—601 R **11 Claims**

1. A process for the preparation of citronellal which comprises hydrogenating citral in the presence of a catalyst consisting essentially of palladium, water and a base at between about 5°C and about 150°C and a pressure of between about 5 psi and about 600 psi the minimum amount of water being about 0.3 grams of water per hundred grams of citral and the amount of base being between 0.1 and 10 grams of base per 100 grams of citral.

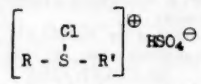
3,860,658

HYDROXYARYL THIOETHERS

Kurt H. Pilgram, Modesto, Calif.; Dirk Medema, Amsterdam, Netherlands; Samuel B. Soloway, and George W. Gaertner, both of Modesto, Calif., assignors to Shell Oil Company, New York, N.Y.

Division of Ser. No. 330,832, Feb. 8, 1973, , which is a division of Ser. No. 72,163, Sept. 14, 1970, Pat. No. 3,732,317. This application Aug. 17, 1973, Ser. No. 389,076
Int. Cl. C07c *149/46*
U.S. Cl. 260—607 B **3 Claims**

1. A sulfuric acid solution of a chloro-sulfonium bisulfate of the formula



wherein R and R′ are alkyl, halogenated alkyl, aryl, alkaryl or aralkyl.

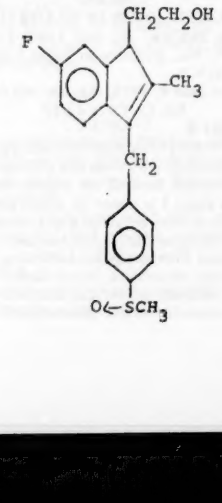
3,860,659

5-FLUORO-2-METHYL 1-(4′-METHYLSULFINYLBENZYLIDENE)-3-INDENYL ETHANOL

David F. Hinkley, Plainfield, and John B. Conn, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 33,890, May 1, 1970, Pat. No. 3,732,292. This application Feb. 6, 1973, Ser. No. 330,165
Int. Cl. C07c *147/14*
U.S. Cl. 260—607 A **1 Claim**

1. A compound of structural formula:



3,860,660

PERFLUORO ORGANIC HYDROPEROXIDES

Charles T. Ratcliffe, Parsippany; Charles V. Hardin, Morris Plains; Lowell R. Anderson, and William B. Fox, both of Morristown, all of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Mar. 23, 1970, Ser. No. 22,082
Int. Cl. C07c *73/06*
U.S. Cl. 260—610 R **4 Claims**

1. A compound having the formula $HOOC(R_f)_2OH$ wherein R_f is selected from the group consisting of perfluoroalkyl groups having from 1 to 6 carbon atoms and perfluorophenyl.

3,860,661

PHENOXYBIPHENYL COMPOUNDS

William C. Hammann, Creve Coeur, and Robert M. Schisla, Kirkwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 845,079, July 25, 1969, abandoned, which is a continuation-in-part of Ser. No. 801,875, Aug. 19, 1968, abandoned, which is a division of Ser. No. 310,457, Sept. 20, 1963, Pat. No. 3,406,207. This application Apr. 26, 1972, Ser. No. 247,528
Int. Cl. C07c *43/22*
U.S. Cl. 260—613 R **4 Claims**

1. 3,3′-bis(m-phenoxyphenoxy)biphenyl.

3,860,662

PROCESS FOR TREATING THE PRODUCT MIXTURE FROM THE EPOXIDATION OF OLEFINIC HYDROCARBONS

John Kollar, Wallington, N.J., assignor to Halcon International, Inc., New York, N.Y.

Continuation of Ser. No. 684,563, Nov. 20, 1967, abandoned, which is a continuation of Ser. No. 409,941, Nov. 9, 1964, abandoned, which is a continuation-in-part of Ser. No. 375,313, June 15, 1964, abandoned. This application Nov. 7, 1969, Ser. No. 871,522
Int. Cl. C07c *27/10, 29/00*
U.S. Cl. 260—618 C **12 Claims**

1. The process for treating the product mixture from the epoxidation of an olefinic hydrocarbon having two to 30 carbon atoms with an organic hydroperoxide having the formula ROOH where R is an alkyl, cycloalkyl or aralkyl radical having three to 20 carbon atoms at a temperature of −20° to 200°C. in the presence of a titanium, vanadium, chromium, selenium, zirconium, columbium, molybdenum, tellurium, tantalum, tungsten, rhenium, or uranium catalyst in order to reduce the acidic catalyst characteristics of said mixture at least to the extent that the rate of dehydration of alcohol contained therein is less than 50 percent per hour at 140°C. which comprises incorporating in said mixture a basic material selected from the group consisting of alkali metal and alkaline earth metal inorganic salts, hydroxides, oxides, alkoxides, amides, alkanoates, and napthenates in the amount of 0.05 to 10 mols per mol of said catalyst and recovering said alcohol therefrom by distillation.

3,860,663

DIRECT NITRATION OF O-SEC-BUTYLPHENOL WITH NITRIC ACID IN A LOWER CARBOXYLIC ACID

Gene A. Anderson; Robert E. Bailey, and Wilson F. Gum, Jr., all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 20, 1970, Ser. No. 91,535
Int. Cl. C07c 79/24
U.S. Cl. 260—622 R 6 Claims

1. A process for the liquid phase direct nitration of o-sec-butylphenol (OSBP) comprising contacting OSBP with nitric acid having a concentration of from about 20 weight percent to fuming nitric acid in the presence of a lower carboxylic acid solvent selected from the group consisting of acetic acid and propionic acid in an amount to reduce secondary butylquinone formation and from 5 to 100 mole percent based on the OSBP of a liquid oxidation inhibitor, which is at least partially soluble in the reaction medium, selected from the group consisting of 2-propanol, 2-butanol, 2-pentanol, t.-butyl alcohol, isopropyl nitrate, acetaldehyde, acetone and 2-butanone at a temperature of from about 10° to about 85°C.

3,860,664

PROCESS FOR CONDENSATION OF ALCOHOLS

James E. Yates, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed June 6, 1973, Ser. No. 367,689
Int. Cl. C07c 29/00, 31/02
U.S. Cl. 260—642 7 Claims

1. A process for producing higher molecular weight hydrocarbon alcohols by forming a reaction mixture consisting of at least one lower molecular weight alkanol having a methylene group adjacent the hydroxylated carbon atom, an alkali catalyst and a catalytic amount of a palladium (II) compound selected from palladium (II) halide and compounds defined by $(Y)_2Pd(X)_4$
wherein Y is ammonium or an alkali metal and X is a halogen, said alkali catalyst being an alkali metal, alkali metal hydroxide, alkali metal oxide, alkali metal bisulfite, or alkali metal hydrocarbon alcoholate, said palladium (II) compound being mixed with the alkanol prior to dissolution of the alkali catalyst therein with the reaction mixture being formed at temperatures below that necessary to effect condensation of the alkanol, and heating the reaction mixture from about 80° to about 300°C to effect condensation of the alkanol while simultaneously removing water as it forms.

3,860,665

METHYLENE CHLORIDE STABILIZED WITH TETRAHYDROFURAN

Norman L. Beckers, Chardon, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Feb. 23, 1973, Ser. No. 335,365
Int. Cl. C07c 17/40, 17/42
U.S. Cl. 260—652.5 A 2 Claims

1. A stabilized methylene chloride composition consisting essentially of methylene chloride and stabilizing amounts of from about 0.05 to about 2.0 percent by weight of the methylene chloride of each of tetrahydrofuran and propylene oxide.

3,860,666

PREFERENTIAL HYDROCHLORINATION IN PERCHLOROETHYLENE PROCESS

Norman L. Beckers, Chardon, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 73,661, Sept. 18, 1970, abandoned. This application Oct. 24, 1972, Ser. No. 299,706
Int. Cl. C07c 21/00
U.S. Cl. 260—654 H 3 Claims

1. In a process for the production of perchloroethylene wherein ethylene and/or partially chlorinated ethylene are chlorinated in an alumina-containing fluid bed reactor, and the hydrogen chloride, perchloroethylene, trichloroethylene and aluminum chloride in the reaction gases are subsequently subjected to anhydrous quenching, the improvement which comprises preventing the aluminum chloride-catalyzed hydrochlorination of the trichloroethylene present in the reaction gases by the addition to the reaction gases subsequent to withdrawal from the reactor of a preferentially hydrochlorinatable ethylenically unsaturated chlorinated hydrocarbon of from two to four carbon atoms and having less than three chlorine atoms attached to the ethylenic carbons, about 0.005 to about 0.05 mole percent of the preferentially hydrochlorinatable material being added per p.p.m. of aluminum chloride present.

3,860,667

METHOD OF PREPARING 1-METHYL-3-PHENYL-INDANE

Thomas F. Rutledge, Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.

Filed Jan. 3, 1974, Ser. No. 430,550
Int. Cl. C07c 15/06
U.S. Cl. 260—668 F 6 Claims

1. In a method of preparing 1-methyl-3-phenyl-indane from styrene by dimerizing styrene in sulfuric acid, the improvement which comprises conducting the dimerization reaction in a dilute aqueous solution of sulfuric acid and an alcohol selected from the group consisting of ethanol and isopropanol.

3,860,668

ALKYL BENZENE ISOMERISATION PROCESS

John Kenneth January, and Alan Marchant, both of Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 24, 1973, Ser. No. 409,317
Claims priority, application Great Britain, Oct. 24, 1972, 48927/72
Int. Cl. C07c 5/24
U.S. Cl. 260—668 A 8 Claims

1. A process for isomerising an alkyl benzene which comprises contacting a feedstock comprising at least one alkyl benzene with a silica/alumina catalyst which is free from any hydrogenating component which would hydrogenate said alkyl benzene to the corresponding naphthene, in the presence of a cyclic hydrocarbon added to the feedstock in a concentration of 1 to 20 percent by weight of the feedstock, said cyclic hydrocarbon being selected from the group consisting of an octahydroanthracene, Tetralin, Decalin, cyclohexane, cyclohexyl cyclohexane, methyl cyclohexane, a di-, tri- or tetramethyl cyclohexane, ethyl cyclohexane, ethylmethyl- and diethyl-cyclohexanes.

3,860,669

2,4-DIMETHYL-3 METHYLENE-1,4-PENTADIENE AND POLYMER

Roe Calvin Blume, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 231,395, March 2, 1973, Pat. No. 3,806,551. This application Oct. 9, 1973, Ser. No. 404,790
Int. Cl. C07c 11/24
U.S. Cl. 260—677 R 1 Claim

1. 2,4-Dimethyl-3-methylene-1,4-pentadiene.

3,860,670
PRINTING INK BINDER

Albert Uhlemayr, Forstinning, and Heinz Traitteur, Munich, both of Germany, assignors to Michael Huber Munchen, Heimstetten, Germany

Filed July 6, 1972, Ser. No. 269,296
Claims priority, application Germany, July 8, 1971, 2134103; Feb. 17, 1972, 2207481
Int. Cl. C08f *29/10*
U.S. Cl. 260—829 **7 Claims**

1. A process for the production of a film-forming condensation product for use as an ink binder, comprising reacting while heating

1. a thermoplastic hydrocarbon resin containing at least one unsaturated bond and having a melting point of 60°–180°C. and an iodine number between 30 and 200, said hydrocarbon resin comprising the polymerization product of unsaturated hydrocarbons contained in the C_8 to C_{10} fraction of the distillation run of a petroleum cracker
2. an alkylphenol in which the alkyl group contains 4 to 12 carbon atoms in mixture with bisphenol; and
3. formaldehyde or paraformaldehyde;

said reaction being carried out in the presence of oxalic acid as a catalyst, and wherein said phenol, said formaldehyde and the unsaturated bond in said hydrocarbon resin are present in an approximately stoichiometric ratio.

3,860,671
POLYAMIDE FIBERS WITH IMPROVED ANTISTATIC EFFECT AND THEIR PREPARATION

Joachim Kowallik, Aschaffenburg, and Erich Kessler, Hoechst, both of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Mar. 22, 1974, Ser. No. 453,766
Claims priority, application Germany, Mar. 29, 1973, 2315681
Int. Cl. C08g *41/04*
U.S. Cl. 260—858 **9 Claims**

1. In a process for the production of linear polyamide fibers, the improvement of imparting an increased antistatic effect to said fibers which comprises:

uniformly admixing with a fiber-forming linear polyamide about 2 to 5 percent by weight of polyalkyleneoxide reaction product of the formula

$$[HO\langle CR'H\text{-}CH_2\text{-}O\rangle_n CONH\text{-}R\text{-}NH\text{-}]_2\, C{=}O \quad (I)$$

in which *n* is an integer of 20 to 200, R is a bivalent hydrocarbon radical having a total of about 3 to 15 carbon atoms with at least 3 up to 10 carbon atoms extending between the two nitrogen atoms, R′ is hydrogen or methyl;

melt spinning and stretching the resulting mixture to form a fibrous product exhibiting a durable resistance to static electricity.

3,860,672
LOW DENSITY RESIN COMPOSITE OF HIGH STIFFNESS

Paul Lagally, Annapolis, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Apr. 12, 1974, Ser. No. 460,420
Int. Cl. C08f *45/72, 27/10*
U.S. Cl. 260—859 **6 Claims**

1. A process for producing a cured polydiene resin comprising:

1. contacting (A) a dihydroxy polydiene having (1) two terminal hydroxy groups and (2) a predominate amount of vinyl groups on alternate carbon atoms of the polydiene backbone, with (B) an organic chain extender which is a diisocyanate, and with (C) a graft comonomer selected from the group consisting of N-vinyl-2-pyrrolidone, N-vinyl-3-pyrrolidone, N-vinylcarbazole, N-vinyl imidazole, N-vinyl-pyridine, courmarone, indene and mixtures thereof, in the presence of (D) a perioxide free radical initiator to produce an elastomeric material having the perioxide and the graft comonomer dispersed therethrough substantially unreacted, and then (II) curing the elastomer at elevated temperatures to produce a firm resinous material.

3,860,673
ELASTOMERIC COMPOSITIONS

John Brian Lawrence, Meerbusch-Struemt, Germany, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed July 31, 1973, Ser. No. 384,358
Int. Cl. C08g *22/00*
U.S. Cl. 260—859 R **17 Claims**

1. An elastomeric composition comprising (A) a synthetic or naturally occurring elastomer; (B) an organic polyisocyanate which has been at least partially trimerized and (C) a catalyst which is effective to trimerize (B).

3,860,674
COMPOUNDS HAVING PEROXY AND ALIPHATIC AZO GROUPS AND METHODS USING THESE AS INITIATORS

Chester Stephen Sheppard, Tonawanda; Ronald Edward MacLeay, Williamsville, both of N.Y., and Richard Anthony Bafford, Aiken, S.C., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 37,310, May 14, 1970, Pat. No. 3,812,095, which is a continuation-in-part of Ser. No. 703,241, Feb. 6, 1968, abandoned. This application Oct. 24, 1973, Ser. No. 409,107
Int. Cl. C08f *19/10*
U.S. Cl. 260—886 **4 Claims**

1. A method of preparing a block polymer which method comprises:

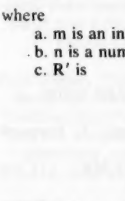
1. forming a polymer having azo groups present by reacting vinyl-type monomer and an azo-peroxy compound under vinyl polymerization conditions, controlling conditions in order to cause the peroxyoxygen linkages to rupture prior to rupture of the azo-carbon linkages, said rupture of the peroxy-oxygen linkages having the effect of initiating said polymerization; and
2. reacting vinyl-type monomer with the polymer of step (1) under conditions to rupture the azo-carbon linkages of said step (1) polymer to produce a block polymer product,

said azo-peroxy compound having the formula:

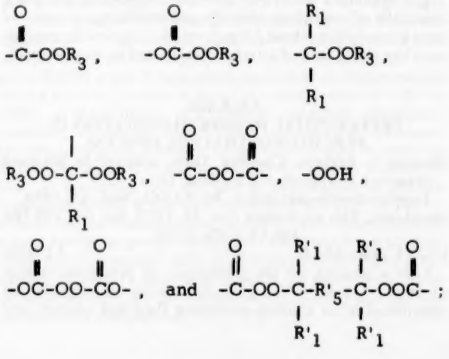
$$[(R\text{-}N{=}N\text{-}R')_m\text{-}X]_n$$

where

a. m is an integer equal to 1–2;
b. n is a number equal to 1–10;
c. R′ is



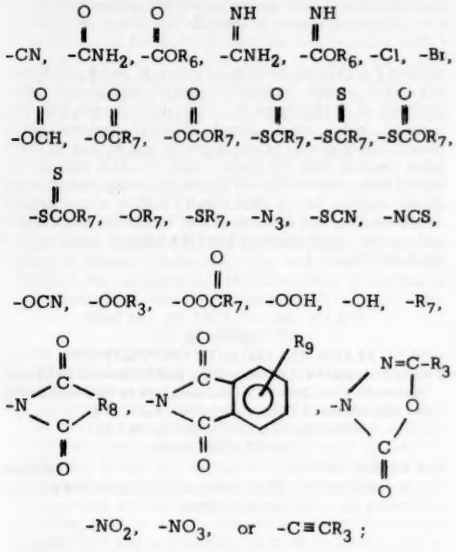
d. X is a peroxy containing radical selected from



and

e. R_1 and R'_1 can be the same or different and are alkyl or cycloalkyl radicals having 1–10 carbon atoms;

f. R_2 is selected from



g. R_3 is a tertiary aliphatic radical having 4–10 carbon atoms;

h. R_5 and R'_5 can be the same or different and are aliphatic diradicals having 1–20 carbons optionally containing in the backbone structure one or more non-adjacent oxygen, sulfur or nitrogen atoms; aromatic diradicals having 6–12 carbons; or aromatic-aliphatic diradicals having 7–20 carbons optionally containing in the backbone structure one or more non-adjacent oxygen sulfur or nitrogen atoms;

i. R_6 is a lower alkyl radical;

j. R_7 is an alkyl or cycloalkyl radical of 1–10 carbons or an aromatic radical of 6–12 carbons;

k. R_8 is a lower alkylene diradical;

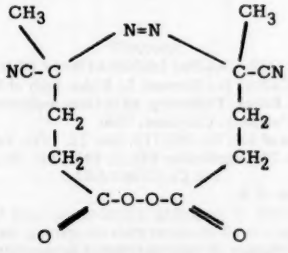
l. Rg is hydrogen, an alkyl or cycloalkyl radical of 1–10 carbons, or an aromatic radical of 6–12 carbons;

m. R_1 and R_5 together with the tertiary carbon atom in R′ can form a cycloalkyl triradical of 3-10 3–10 and

n. R is (a) a tertiary aliphatic radical of 4–10 carbons, (b) R′ -X or (c) R′ when m is 1 and X is a diradical.

2. A method of preparing a polystyrene-poly(methyl methacrylate) block copolymer which method comprises:

1. reacting styrene with an initiating amount of an azoperoxide,



in a nitrogen atmosphere at 50°C for about 24 hours; and

2. reacting methyl methacrylate with the azo containing polystyrene of step (1) in a nitrogen atmosphere at 75°C for about 7 hours.

3. A method of preparing a block polymer which method comprises:

1. forming a polymer having peroxy groups present by reacting vinyl-type monomer and an azo-peroxy compound under vinyl polymerization conditions, controlling the conditions in order to cause the azo-carbon linkages to rupture prior to rupture of the peroxy-oxygen linkages, said rupture of the azo-carbon linkages having the effect of initiating said polymerization; and
2. reacting vinyl-type monomer with the polymer of step (1) under conditions to rupture the peroxy-oxygen linkages of said step (1) polymer to produce a block polymer product,

said azo-peroxy compound having the formula:

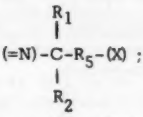
$$[(R\text{-}N{=}N\text{-}R')_m\text{-}X]_n$$

where:

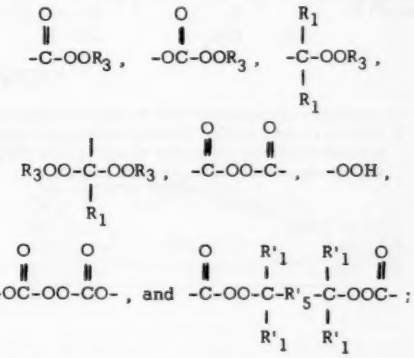
a. m is an integer equal to 1–2;

b. n is a number equal to 1–10;

c. R′ is

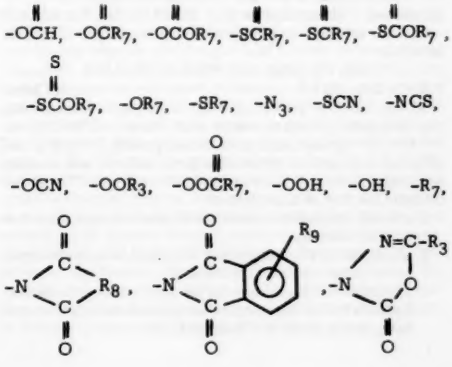


d. X is a peroxy containing radical selected from



e. R_1 and R'_1 can be the same or different and are alkyl or cyloalkyl radicals having 1–10 carbon atoms:

f. R_2 is selected from



g. R_3 is a tertiary aliphatic radical having 4–10 carbon atoms;

h. R_5 and R'_5 can be the same or different and are aliphatic diradicals having 1–20 carbons optionally containing in the backbone structure one or more non-adjacent oxygen, sulfur or nitrogen atoms; aromatic diradicals having 6–12 carbons; or aromatic-aliphatic diradicals having 7–20 carbons optionally containing in the backbone structure one or more non-adjacent oxygen, sulfur or nitrogen atoms;

i. R_6 is a lower alkyl radical;

j. R_7 an alkyl or cycloalkyl radical of 1–10 carbons or an aromatic radical of 6–12 carbons;

k. R_8 is a lower alkylene diradical;

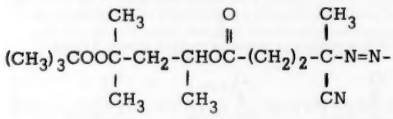
l. Rg is hydrogen, an alkyl or cycloalkyl radical of 1–10 carbons, or an aromatic radical of 6–12 carbons;

m. R_1 and R_5 together with the tertiary carbon atom in R′ can form a cycloalkyl triradical of 3–10 carbons; and

n. R is (a) a tertiary aliphatic radical of 4–10 carbons, (b) R′-X or (c) R′ when m is 1 and X is a diradical.

4. A method of preparing a polystyrene-poly(methyl methacrylate) block copolymer which comprises:

1. reacting a xylene solution of styrene with an initiating amount of an azo-peroxide,



in a nitrogen atmosphere at 90°C for about 6 hours; and

2. reacting a xylene solution of methyl methacrylate and the peroxide containing polystyrene of step (1) in a nitrogen atmosphere at 120°–129°C for about 8 hours.

3,860,675

PROCESS FOR THE PREPARATION OF BLOCK POLYMERS

Gottfried Pampus, Leverkusen; Josef Witte, Koeln, and Martin Hoffman, Bergisch, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 124,933, March 16, 1971, abandoned. This application Dec. 20, 1973, Ser. No. 426,489

Claims priority, application Germany, Apr. 9, 1970, 2016840

Int. Cl. C08d *9/08;* **C08f** *29/12, 41/00*

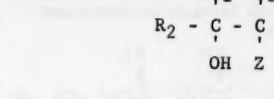
U.S. Cl. 260—887 **8 Claims**

1. A process for producing block copolymers from at least two different polymers which each have —CH=CH_2 or —CH=CH— groups, said process comprising dissolving said different polymers in an inert organic solvent and treating resulting solution at a temperature of −60° to 60°C. with a catalytic amount of a catalyst of

a. a halide, oxyhalide or alkoxy halide of tungsten, tantalum or molybdenum,

b. aluminum trialkyl, aluminum haloalkyl, aluminum oxyalkyl or aluminum alkoxyalkyl and

c. a member selected from the group consisting of epihalohydrin wherein halo is chlorine, bromine or iodine and an halogenated alcohol of the formula



wherein Z is chlorine, bromine or iodine; R_1 and R_2 are hydrogen, alkyl, phenyl, naphthyl, biphenyl, alkylphenyl, alkylnaphthyl, or alkylbiphenyl; R_3 and R_4 are hydrogen, chlorine, bromine, iodine, alkyl, phenyl, naphthyl, biphenyl, alkylphenyl, alkylnaphthyl or alkylbiphenyl and R_1 and R_3 when taken together with the carbon atom to which they are attached form a five-membered hydrocarbon ring, said alkyl and alkoxy moieties having from 1 to 12 carbon atoms; catalyst constituents (a) and (b) being in a molar ratio of 1:0.5 to 1:15 and catalyst constituents (a) and (c) being in a molar ratio of 1:0.3 to 1:10.

3,860,676

FLAME RETARDANT COMPOSITIONS

Joseph J. Krackeler, Los Altos Hills, and Michael C. DeClerck, Mountain View, both of Calif., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed May 23, 1973, Ser. No. 363,217

Int. Cl. C08f *45/58*

U.S. Cl. 260—897 B **11 Claims**

1. A cross-linkable, flame retardant polymeric composition comprising the following ingredients:

	Weight %
(a) polymer blend of approximately equal amounts of low density polyethylene plus ethylene-vinyl acetate copolymer	50 to 75
(b) antimony compound	5 to 20
(c) 1,2,3,4,5,6,7,8,9,10,10,11,11-dodeca-chloro-1,4,4a,5a,6,9,9a,9b-octahydro-1,4,6,9-dimethanodibenzofuran;	20 to 35
(d) an acid acceptor selected from the group consisting of tetrabasic lead fumarate, magnesium oxide, calcium carbonate and litharge	0.5 to 2.0
(e) a polyfunctional monomeric cross-linking agent selected from the group consisting of triallyl isocyanurate, triallyl cyanurate, trivinyl cyanurate and trivinyl citrate	0.1 to 5.0

3,860,677

METHOD FOR MAKING DETONATION CORD DEVICE

Brooke J. Calder, Jr.; Bernard L. Risko, both of Solon, and Robert J. Belock, Twinsburg, all of Ohio, assignors to Austin Powder Company, Cleveland, Ohio

Division of Ser. No. 108,712, Jan. 22, 1971, Pat. No. 3,726,216. This application Feb. 5, 1973, Ser. No. 329,842

Int. Cl. C06b *21/02*

U.S. Cl. 264—3 R **7 Claims**

1. A method of preparing a detonating cord having improved angle cut-off characteristics comprising the steps of, taking a mixture of penetaerythritol tetranitrate having a screen analysis of less than about 35 percent by weight retained on a 100 mesh sieve, and a moisture content of less than 1 percent by weight,

loading the material in columnar form at a predetermined rate, and

encapsulating the column of explosive so that at least one of said loading and encapsulating steps applies sufficient force to reduce said material in particle size so that said explosive in the finished form has a granulation with a screen analysis of less than about 15 percent by weight retained on a 100 mesh sieve so that said cord will transmit a detonation wave from another cord disposed at less than *a* 20 degree angle to the first mentioned cord, and with the angle being disposed in the direction of propogation of the detonation wave along the other cord.

3,860,678

METHOD OF MANUFACTURING A CONSOLIDATED DOUBLE BASE PROPELLANT

Thomas E. Martin, Blountsville, Ala., and John C. Horvath, Radford, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 24, 1973, Ser. No. 354,553

Int. Cl. C06b *21/02*

U.S. Cl. 264—3 A **3 Claims**

1. A method of manufacturing a consolidated double base propellant system, said method comprising:

a. providing and directing one or more thin sheets of cured double base propellant and a reinforcing mesh between variable speed rollers having means for heating and cooling and means for varying the force which the rollers exert during a rolling operation for consolidation of said propellant and said reinforcing mesh;

b. rolling said one or more thin sheets of cured double base propellant and said reinforcing mesh to form a consolidated double base propellant system, said rolling being accomplished by said rollers which may be at a temperature from an ambient temperature to an elevated temperature up to about 212°F while exerting sufficient force to obtain consolidation of the propellant and reinforcing mesh to a predetermined thickness to yield the desired propellant ballistics from a consolidated double base propellant system.

3,860,679

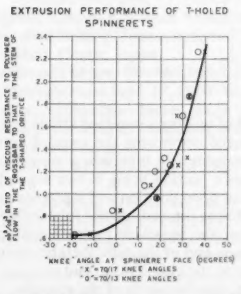
PROCESS FOR EXTRUDING FILAMENTS HAVING ASYMMETRIC CROSS-SECTION

Byar Hazim Shemdin, Brooklyn, N.Y., assignor to Fiber Industries, Inc., Charlotte, N.C.

Division of Ser. No. 195,028, Nov. 2, 1971, Pat. No. 3,738,789, which is a division of Ser. No. 14,352, Feb. 26, 1970, Pat. No. 3,652,753. This application Jan. 29, 1973, Ser. No. 327,337

Int. Cl. D01d *3/00, 5/00*

U.S. Cl. 264—40 **2 Claims**



1. Process for producing a spinerette for extruding filament-forming material having at least one asymmetrically shaped orifice therein wherein filament kneeing at said asymmetrically shaped orifice is reduced which comprises,

a. extruding filament-forming material through a plurality of orifices of the same asymmetrical shape and different orifice dimensions;

b. measuring the knee angles formed by the filament-forming materials during extrusion through each of said orifices;

c. plotting the knee angle against the extrusion factor for each of said orifices whereby a smooth curve may be drawn;

d. selecting the extrusion factor corresponding to the zero knee angle; and

e. manufacturing a spinnerette plate having orifice dimensions corresponding to said last-mentioned extrusion factor.

3,860,680

METHODS OF MAKING MICROPOROUS POLYMER MATERIALS

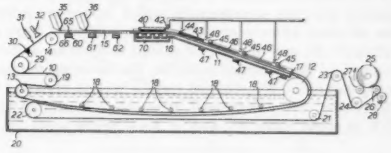
Eric Albert Warwicker, and Ronald Hodgkinson, both of Norfolk, England, assignors to Porvair Limited, Norfolk, England

Filed May 31, 1972, Ser. No. 258,381

Claims priority, application Great Britain, June 2, 1971, 18640/71

Int. Cl. B29d *27/04;* **B32b** *27/00, 27/40*

U.S. Cl. 264—41 **19 Claims**



1. A process for making water vapour permeable polymer sheet material which comprises forming a layer at least 0.5 mms thick of coagulable film forming polymer composition, comprising polymer and solvent therefor, on a porous solid support, the said layer having a free surface and the said porous support having a free surface, bringing said layer of coagulable film forming polymer composition into contact with a liquid non solvent coagulant for the said polymer while there is continuous relative movement between (a) said support and (b) the point of application of said polymer composition to said support and the point of contact of non solvent coagulant with said composition, said point of application being upstream of said point of contact, the said composition and the said coagulant being such that said contact results in coagulation of the said layer to porous water vapour permeable form, and then stripping the coagulated layer from the support, characterized in that the support is arranged to be dry and evenly porous upstream of said point of application and in that before the polymer has penetrated through the support, non solvent coagulant liquid is evenly applied to the free surface of the porous support across the width of the layer, upstream of said point of contact and downstream of said point of application, the porosity of the support and the amount and moment of application of the coagulant to said free surface of said support being such as to prevent the layer of polymer penetrating through the support.

3,860,681

METHOD OF MAKING SYNTHETIC AGGREGATES

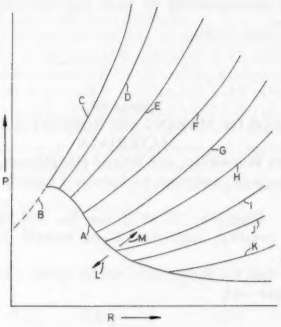
Gerald Charles Bye, Gravesend; Richard Charles Hack, Welling, and Anthony Robin Pennell, Gravesend, all of England, assignors to The Associated Portland Cement Manufacturers Limited, London, England

Filed July 31, 1972, Ser. No. 276,669

Claims priority, application Great Britain, Apr. 26, 1971, 11291/71

Int. Cl. C04b *31/20*, *33/32*

U.S. Cl. 264—66 3 Claims



1. In a method for the production of a synthetic roadstone comprising forming a sinterable ceramic raw material into a moist plastic mass, extruding said mass through an extrusion die, thereafter sintering the extruded material, and breaking up the sintered material to form an aggregate of the desired particle size, the improvement which comprises controlling the moisture content of said raw material, the form of the extrusion die and the rate of extrusion to cause severe "fir-coning" of the extruded material, the sintering temperature being controlled whereby the surface texture imparted by the "fir-coning" is not destroyed to provide a roadstone having a PSV of above about 65, and an AAV below about 20.

3,860,682

PROCESSING OF FINELY DIVIDED PARTICULATE MATERIALS

Helmut Reinhardt, Holzweg 2, Weiss near Cologne; Bernd Brandt, Vochemer Strasse 9, and Albert Peters, Erlenweg 14, both of Wesseling-Berzdorf, all of Germany

Filed Nov. 30, 1971, Ser. No. 203,332

Claims priority, application Germany, Nov. 8, 1968, 1807714

Int. Cl. B29c *15/00*

U.S. Cl. 264—92 5 Claims

1. A method of compacting finely divided particulate material, comprising:

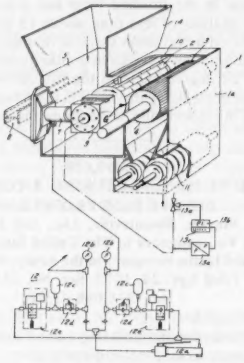
a. feeding a mass of said particulate material against a gas-permeable circumferential wall of a rotatable hollow first roller;

b. rotating an exteriorly profiled second roller in axial parallelism with said first roller at such spacing from the same as to form therewith a gap;

c. rotating said first roller and subjecting the interior thereof to a partial vacuum so as to attract said particulate material by suction to the exterior of said circumferential wall for forming thereon a continuous circumferential layer;

d. allowing said first roller to move toward and away from said second roller in dependence upon the thickness of said layer on said first roller in said gap so as to allow the width of said gap to vary also in dependence upon the thickness of said layer on said first roller in said gap; and

e. yieldably biasing said first roller towards said second roller during the movement of said first roller toward and away from said second roller, with a biasing force which remains constant during such movement of said first roller towards and away from said second roller and during any variations in the width of said gap which are



caused thereby, whereby to compact said continuous circumferential layer in said gap with said constant biasing force and convert it into a compacted layer which has a substantially uniform density throughout.

3,860,683

METHOD FOR BLOW MOLDING AN ARTICLE HAVING A RE-ENTRANT PORTION

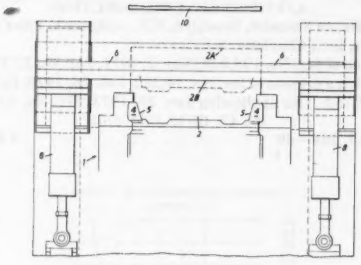
Dennis H. Ward, 1, Garvock Dr., Kippington Rd., Sevenoaks, England

Filed June 25, 1973, Ser. No. 373,305

Claims priority, application Great Britain, July 27, 1972, 35167/72

Int. Cl. B29c *17/07*

U.S. Cl. 264—96 11 Claims

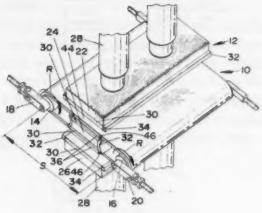


1. A method of making a moulded article by blow moulding a plastics material comprising the steps of extruding plastics material in the form of a tube into a mould having an open portion said open portion being in two separable parts movable between an open position and a plastics material clamping position, closing the ends of said tube including the step of moving together the separable parts of said open portion to clamp closed one end of the tube therebetween, applying gas under pressure to the closed tube, said pressure being applied continuously during the whole of the moulding operation, and during said continued application of said gas pressure closing the open portion of the mould against the expanding plastics material to form a re-entrant portion of an article being moulded.

3,860,684
ENDLESS BELT MAKING

James C. Vance, Sr., Sedalia, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Jan. 10, 1974, Ser. No. 432,366
Int. Cl. B28b *11/12*
U.S. Cl. 264—157 9 Claims



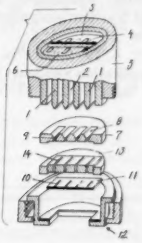
1. A method for curing a power transmission belt sleeve in an open ended press comprising the steps of:
supporting the sleeve at spaced points on its inner periphery;
moving the supporting points apart tensioning the belt sleeve;
pressurizing and heating at least one circumferential initial segment of the sleeve while simultaneously molding the initial segment to a predetermined thickness and cooling the belt sleeve adjacent the initial segment;
partially curing the initial segment;
pressurizing and heating successive circumferential segments of the sleeve while simultaneously molding the segments to the thickness and cooling the sleeve adjacent each segment, each successive segment overlapping at least half of its preceding segment;
incrementally curing the successive segments, each successive segment receiving generally a 100 percent effective cure after complete overlapping by successive segments;
pressurizing and heating at least a portion of the initial segment by overlapping with at least one of the successive segments, while simultaneously molding the successive segments to the thickness and cooling the sleeve adjacent the successive segments; and
incrementally curing the initial segment, in conjunction with the overlapping successive segments effecting at least a 100 percent cure of the initial segment.

3,860,685
METHOD AND APPARATUS FOR SPINNING MULTICOMPONENT FIBERS

Kazumi Nakagawa; Keijiro Kuratani; Shinsaku Minami, and Zoda Keiichi, all of Saidaiji, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Continuation-in-part of Ser. No. 463,144, June 11, 1965, abandoned. This application Sept. 17, 1968, Ser. No. 767,900
Claims priority, application Japan, June 15, 1964, 39-33823The portion of the term of this patent subsequent to July 14, 1999, has been disclaimed.
Int. Cl. B29f *3/10*; D01d *3/00*
U.S. Cl. 264—171 5 Claims

1. A method of spinning multi-component fibers from at least two different fiber-forming spinning solutions by extruding them concurrently through a common orifice to produce a composite stream with the parts in interfacial contact, then flowing the thus formed composite stream through a continuous substantially uniform cross-section channel which is separate from adjacent channels for other streams of spinning solution for at least 0.1 second, said time being sufficient so that there is formed in the boundary layer of said spinning solutions, an intermediate area wherein the spinning solutions are sufficiently intermingled and diffused in each other to firmly join the different components in subsequently extruded

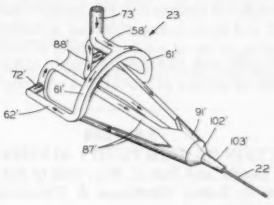


filaments and thereafter extruding the composite stream through an orifice to form composite filaments.

3,860,686
METHOD OF AND APPARATUS FOR EXTRUDING PLASTIC MATERIALS

Daryl Lester Myers, Lawrenceville, Ga., assignor to Western Electric Company, Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 260,584, June 7, 1972, abandoned. This application Nov. 3, 1972, Ser. No. 303,435
Int. Cl. B29f *3/10*
U.S. Cl. 264—174 7 Claims



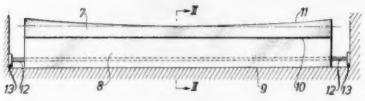
1. A method of extruding a plastic covering around a filamentary core advancing sequentially through an extrusion chamber and an extrusion die which comprises the steps of:
forcing a stream of molten plastic compound into the chamber transversely of said advancing core;
bending said stream in the direction of the moving core at a first predetermined radial distance therefrom,
dividing said bent stream into a first plurality of distinct streams in paths circumferentially spaced around the core at said first predetermined radial distance therefrom, each of said streams being of a sufficient length with respect to its cross-sectional size to achieve equal and constant pressures and velocities at the extremities thereof;
directing said first plurality of streams radially inward toward said core;
dividing each of said radially directed streams of plastic material into a second plurality of distinct streams circumferentially spaced around the core at a second lesser radial distance therefrom with all of the material of each of said second plurality of distinct streams being moved toward said extrusion die, each of said streams being of a sufficient length with respect to its cross-sectional size to achieve equal and constant pressures and velocities at the extremities thereof; and
assembling said last divided streams at said die circumferentially around the core.

3,860,687

METHOD OF PRODUCING A PRESTRESSED CONCRETE MEMBER

Karl-Gustav Bernander, Bandhagen, and Herbert Keller, Stockholm, both of Sweden, assignors to AB Strangbetong, Stockholm, Sweden

Filed Oct. 4, 1972, Ser. No. 299,096
Claims priority, application Sweden, Oct. 5, 1971, 12576/71
Int. Cl. B28b 23/14
U.S. Cl. 264—228 6 Claims



1. A method of producing a prestressed concrete member comprising the steps of: casting a substantially rectangular slab integrally with at least one underlying beam extending in the longitudinal direction of said slab, said slab having a concave upper surface in the longitudinal direction thereof and said beam having a planar bottom surface so as to impart a varying cross-section to said concrete member along its length, said concrete member having the center of gravity located in the beam portion; embedding at least one longitudinally extending reinforcement in said beam below said center of gravity; prestressing said reinforcement between anchoring means located exteriorly of the ends of said beam; permitting said concrete member to harden; and releasing said prestressed reinforcement from said anchoring means so as to impart an upward camber to said concrete member with the bottom of said beam being displaced upwardly to an extent corresponding to the upward movement of said slab whereby the upper surface of said slab assumes a substantially planar and the bottom surface of said beam a concave configuration.

3,860,688

PRODUCTION OF HIGH PURITY ALUMINA HYDRATE

Burton J. Beadle, and Jack C. Ray, both of Baton Rouge, La., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed July 17, 1973, Ser. No. 380,113
Int. Cl. C01f 7/46
U.S. Cl. 423—131 5 Claims

1. A process for reducing the leachable sodiumcontaining impurity level of Bayer process alumina hydrate of the formula $Al_2O_3 \cdot 3H_2O$ to below about 0.015 percent by weight of the hydrate (calculated as Na_2O) which comprises intimately contacting an aqueous slurry of alumina hydrate in a treating vessel with steam at atmospheric pressure for an average time period between 1 and about 4 hours, while maintaining the slurry within a temperature range of about 60°C and 99°C under agitation, removing the treated slurry from the vessel and recovering purified hydrate from the slurry.

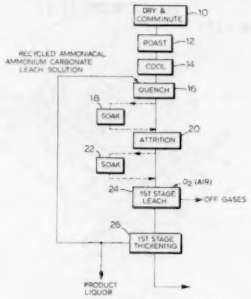
3,860,689

PROCESS FOR TREATING HIGH MAGNESIUM NICKELIFEROUS LATERITES AND GARNIERITES

Verner Blakey Sefton, Edmonton; David John Ivor Evans, North Edmonton, and Donald Robert Weir, Fort Saskatchewan, all of Alberta, Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Province of Ontario, Canada

Filed July 19, 1973, Ser. No. 380,936
Int. Cl. C22b 23/04
U.S. Cl. 423—150 12 Claims

1. In the process in which nickeliferous lateritic and garnieritic ore particles containing in excess of about 5% magnesium by weight are treated to reduce nickel values therein to metallic form and the reduced particles are quenched in an aqueous ammoniacal ammonium carbonate solution then are leached with a like solution in the presence of free oxygen to extract nickel values and dissolve them in the leach solution, the improvement which comprises subjecting quenched particles



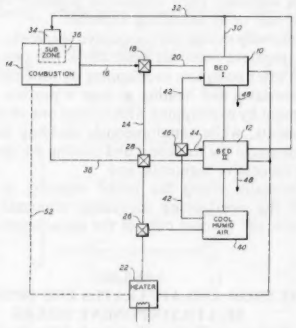
to attrition in order to rub off an outer layer therefrom and to expose surfaces beneath said layer to penetration by the quench solution whereby the proportion of nickel extracted in the leaching operation is substantially increased.

3,860,690

SUPPRESSION OF NITRIC OXIDE

Dimitri Gidaspow, Chicago, Ill., assignor to Institute of Gas Technology, Chicago, Ill.

Filed Nov. 3, 1971, Ser. No. 195,375
Int. Cl. B01d 53/34
U.S. Cl. 423—239 12 Claims



1. A method for suppressing nitric oxide in exhaust streams from a hydrocabon combustion zone comprising

delivering the exhaust stream with small amounts of nitric oxide to a zone containing a salt selected from the group consisting of a ferrous salt and a cobalt salt, said salt being supported on a high surface area sorbent material to accumulate said nitric oxide in large amounts as a nitric oxide complex salt to thereby form a sorption zone,

regenerating said sorption zone with a regenerating gas stream having temperatures sufficiently high to decompose said nitric oxide complex salt to free the accumulated nitric oxide and thereby form a regenerated zone,

recirculating large amounts of nitric oxide in a stream from the regenerated zone to a high temperature subzone of said combustion zone to decompose said recirculated large amounts of nitric oxide to nitrogen and oxygen and delivering a subsequent exhaust stream with small amounts of nitric oxide to said regenerated zone to again form a sorption zone and thereby repeat the cycle.

3,860,691

ACTINIDE MONONITRIDE MICROSPHERES AND PROCESS

Theodore A. Gens, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Sept. 8, 1966, Ser. No. 578,428
Int. Cl. C01g *56/00*; C01f *15/00*
U.S. Cl. 423—254 4 Claims

1. A method for preparing crystalline microspheres consisting essentially of actinide mononitride having one gram atom carbon per gram atom oxygen comprising reacting actinide oxide-carbon microspheres with nitrogen at a first temperature between 1,500°–1,700°C and thereafter thermally cycling said reacted microspheres in a nitrogen atmosphere between said first temperature and 1,000°C at least once.

3,860,692

SODIUM ALUMINUM BORATE

Nelson P. Nies, Laguna Beach, and Richard W. Hulbert, Anaheim, both of Calif., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Filed Mar. 27, 1972, Ser. No. 238,638
Int. Cl. C01b *35/00*
U.S. Cl. 423—277 7 Claims

1. Crystalline hydrated sodium aluminum borate of the approximate formula $2Na_2O{\cdot}Al_2O_3{\cdot}6B_2O_3{\cdot}13H_2O$ having the following principal lines in its X-ray diffraction pattern:

d,A	I/I_1
12.42	14
11.55	100
11.12	25
9.88	20
7.22	6
5.81	18.

3,860,693

PRODUCTION OF CYCLIC PHOSPHONITRILIC CHLORIDE POLYMERS

John C. Graham, Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Apr. 26, 1972, Ser. No. 247,655
Int. Cl. C01b *25/10*
U.S. Cl. 423—300 8 Claims

1. The method of preparing phosphonitrilic chloride polymers which comprises:

1. reacting ammonia and hydrogen chloride in an inert solvent to form a dispersion of ammonium chloride in said solvent,
2. reacting phosphorus trichloride and elemental chlorine in the presence of said dispersion of ammonium chloride in said solvent to produce phosphorus pentachloride, and
3. reacting said phosphorus pentachloride with said ammonium chloride in the presence of an anhydrous metallic salt catalyst selected from the group consisting of cobaltous chloride, aluminum chloride, magnesium chloride, zinc chloride, cupric chloride, stannic chloride, manganous chloride and titanium chloride to form a phosphonitrilic chloride reaction product comprising at least 81.7% of the cyclic trimer of phosphonitrilic chloride and up to 4% linear phosphonitrilic chloride polymers.

3,860,694

PROCESS FOR THE PREPARATION OF PERHYDRATES

Madhusudan D. Jayawant, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 31, 1972, Ser. No. 285,125
Int. Cl. C01b *15/16, 25/26*; C01d *7/26, 11/00*; C22b *29/00*; C01b *31/00*
U.S. Cl. 423—307 36 Claims

1. A dry process for the production of a stable perhydrate comprising:

a. Forming a moist particulate reaction mass by contacting a particulate precursor selected from the group consisting of sodium carbonate, sodium phosphates, and mixtures thereof, of particle size U.S. standard sieve number 14 to 325, under agitation and at a reaction temperature of about 20° to 60°C. with aqueous hydrogen peroxide of about 35 to 90 percent concentration by weight over a period of at least one-quarter hour;
b. Maintaining the reaction mass under the above conditions for a residence period of at least about five minutes after hydrogen peroxide addition is complete;
c. Adding water during the residence period to make the water content of the reaction mass during reaction from about 4 to 35 percent based on the dry weight of the reaction mass;
d. Stabilizing the final product against loss of active oxygen by incorporating therein a stabilizer selected from the group consisting of magnesium sulfate, magnesium silicate, magnesium chloride, magnesium fluosilicate, magnesium oxide, and magnesium hydroxide, expressed as Mg; sodium silicate, expressed as Si and mixtures thereof so as to introduce into the reaction mass, based on the weight of the dry perhydrate, about 300 to 1200 parts per million by weight of Mg and 200 to 10,000 parts per million by weight of Si and
e. Drying the reaction mass.

16. The process of claim 1 wherein the final product is stabilized with 500 to 5,000 parts per million by weight of Si.

3,860,695

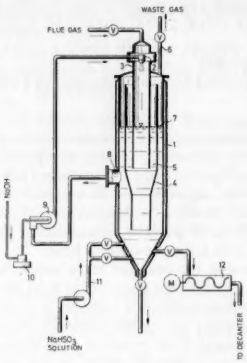
PROCESS FOR THE MANUFACTURE OF SODIUM PYROSULFITE

Adolf Metzger, Wiesbaden; Jorg Scholderer, Frankfurt am Main, and Horst Schreiber, Kelkheim, Taunus, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Filed Apr. 24, 1973, Ser. No. 354,116
Claims priority, application Germany, Apr. 29, 1972, 2221298
Int. Cl. C01d *5/14*
U.S. Cl. 423—519 5 Claims

1. A process for the continuous manufacture of crystalline sodium pyrosulfite which comprises establishing a body of an aqueous reaction medium that is substantially saturated in respect to sodium hydrogen sulfite and has a pH of from 4 to 5, continuously removing a stream of said reaction medium from said body and mixing it in a jet scrubber with a flue gas stream containing 6 percent to 20 percent by volume of sulfur dioxide, introducing the resulting mixture into said body of reaction medium to cause sodium pyrosulfite crystals to precipitate therefrom, separating said crystals from the reaction

medium and returning the mother liquor to said body of reaction medium, and adding a sodium hydroxide or sodium carbonate solution to the recirculated stream of reaction medium at such a rate as to maintain the pH thereof between 4 and 5.

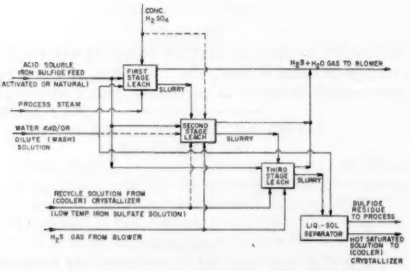


3,860,696

PRODUCTION OF IRON SULFATE MONOHYDRATE

Patrick J. McGauley, 7 Plymouth Rd., Port Washington, N.Y. 11050, and Abraham A. Dor, 12700 Lake Ave., Lakewood, Ohio 44107

Filed Apr. 13, 1971, Ser. No. 133,553
Int. Cl. C01g *49/14*
U.S. Cl. 423—558 **15 Claims**



1. A selective multi-stage leaching process for the extraction of acid reactive iron from sulfide mineral feed, and for the production of a high purity solution of ferrous sulfate, which comprises:

a. contacting the iron sulfide mineral feed in closed vessel leaching equipment with sulfuric acid to form a slurry in which the acid content is deficient to the acid soluble iron in the mineral feed on a stoichiometric basis at sufficient concentrations and temperatures to initiate and produce a high rate of reaction between the acid and the acid soluble iron in the mineral solids, and to generate ferrous sulfate, process heat, and H_2S gas,

b. simultaneously diluting the above slurry with a member of the group consisting of water, aqueous solutions containing ferrous sulfate, sulfuric acid, or mixtures thereof, in quantities sufficient to maintain, in the first stage of the leach, a high density slurry at a vicosity that will permit circulation of the slurry in the equipment,

c. continuing the reaction of the solids with acid in the first stage of the leach, to produce a product that contains residual solids from the mineral feed in a solution that is essentially saturated with ferrous sulfate and containing crystals of ferrous sulfate, and a gas that contains H_2S and water vapor,

d. mixing the above slurry with an aqueous solution that is unsaturated with respect to ferrous sulfate to dissolve the ferrous sulfate crystals and to cause the reaction of the remaining acid and impurities in the solution with acid soluble iron from the mineral feed and H_2S from the gas respectively to complete the leaching in a second stage leach and the produce a low density product slurry containing residue in which the content of acid soluble iron from the mineral feed exceeds the acid content of the solution on a stoichiometric basis, a purified solution that is essentially saturated with ferrous sulfate at temperatures between 80° and 50°C, and and a gas that contains H_2S and water vapor,

e. separating the solution from the solids at temperatures between 80° and 50°C, and

f. collecting the H_2S gas from the leach vessels, the solid residue, and the purified solution as products of the leaching process.

3,860,697

METHOD FOR RECOVERY OF ELEMENTAL SULFUR FROM LOW HYDROGEN SULFIDE SULFUR PLANT FEED GAS

John W. Palm, Tulsa, Okla., assignor to Amoco Production Company, Tulsa, Okla.

Filed Apr. 23, 1973, Ser. No. 353,813
Int. Cl. C01b *17/04*
U.S. Cl. 423—574 **4 Claims**

3. In a process for the recovery of free sulfur from a feed stream containing an amount of H_2S insufficient to maintain combustion in a straight through process and contaminated with hydrocarbons, comprising

1. mixing said feed stream with air,

2. simultaneously and separately burning a gaseous hydrocarbon with air in an amount in excess of that necessary to convert said gaseous hydrocarbon into CO_2 and water, discharging the products from steps 1 and 2 into a noncatalytic reaction zone where free sulfur is formed at a temperature ranging from about 2,000° to about 2,800°F, withdrawing an effluent from said reaction zone containing H_2S and SO_2 in a molar ratio of about 2:1, removing the sulfur therefrom, and thereafter reacting the H_2S and SO_2 in the resulting sulfur-denuded effluent in contact with a catalyst for the reaction to produce sulfur in a known manner.

3,860,698

DUAL TEMPERATURE EXCHANGE SYSTEMS SUITABLE FOR ISOTOPIC EXCHANGE

Jerome S. Spevack, New Rochelle, N.Y., assignor to Deuterium Corporation, White Plains, N.Y.

Filed Mar. 22, 1971, Ser. No. 126,692
Int. Cl. C01b *5/00*
U.S. Cl. 423—580 **18 Claims**

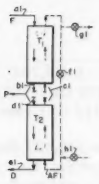
1. In a method for producing a fluid containing a first material concentrated therein, by exchanging at two different temperatures said first material with a second material between chemically different first and second fluid phases which are physically separable from each other and which are each capable of containing each of said materials, said materials being isotopic said method being of the type in which

a. said second fluid phase is passed through each of the second and first units, in that order, of a pair of exchange units, and in which

b. flows of said first fluid phase are passed in countercurrent contact with said second fluid phase in said first and second units of said pair,

c. said first and second units being maintained at different temperatures to cause said second fluid phase to become

enriched in said first material in passing through said second unit, and to become impoverished in said first material in passing through said first unit of said pair, and to cause the first fluid phase to become enriched in said first material in passing through said first unit and to become impoverished in said first material in passing through said second unit of said pair of units, and in which a part of at least one of the enriched fluids passing between said units is withdrawn; the improvement which comprises:



d. delivering a first flow of said first fluid phase containing said materials from a source thereof and passing said flow in countercurrent exchange with said impoverished second fluid in a first delivery-to-discharge path through a portion only of said second unit proximate to its end at which said fluids are most impoverished in said first material, and

e. passing a second flow of first fluid phase in a second delivery-to-discharge path exclusive of said first path in countercurrent exchange with said second fluid phase in other portions of said first unit and second unit of said pair of units and as an enriched flow between said units.

3,860,699

RESIN COMPOSITION SUITABLE FOR USE IN HAIR DRESSING PREPARATIONS

Ikuo Kubota, Kawasaki; Masakatsu Mikami, Nara; Isao Konaka, Uzi, and Toshihiko Misaki, Kyoto, all of Japan, assignors to Shinonaga Kasei Co., Ltd., Osaka, Japan

Filed Feb. 6, 1973, Ser. No. 330,130

Int. Cl. A61k *7/10*

U.S. Cl. 424—47 **12 Claims**

1. A resin composition useful in hair dressing preparations which comprises the resin-containing liquid obtained by refluxing the following copolymerizable monomeric ingredients at 78° – 90° C. in a water-soluble organic solvent:

1. 5 – 89 percent by weight of a diacetone acrylamide,
2. 5 – 40 percent by weight of at least one ester of an alkanol having four to 18 carbon atoms and an acid selected from a group consisting of acrylic acid and methacrylic acid,
3. 6 – 35 percent by weight of at least one acid selected from a group consisting of acrylic acid, methacrylic acid and itaconic acid,
4. 0 – 84 percent by weight of at least one ester of an alkanol having one to three carbon atoms and an acid selected from a group consisting of acrylic acid and methacrylic acid.

3,860,700

CERTAIN COPOLYMERS AND THEIR USE IN COSMETICS

Andre Viout, Paris, France, and David Esanu, deceased, late of Pantou, France (by Lydie Esther Samama, administratrix), assignors to Societe Anonyme dite: L'Oreal, Paris, France

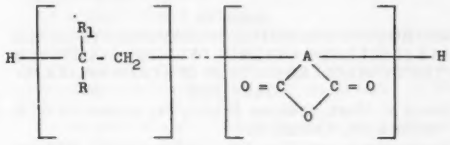
Continuation-in-part of Ser. No. 136,238, April 21, 1971, abandoned, which is a continuation of Ser. No. 688,969, Dec. 8, 1967, abandoned. This application July 21, 1971, Ser. No. 164,828

Claims priority, application Luxembourg, Dec. 8, 1966, 52541

Int. Cl. A61k *7/04*

U.S. Cl. 424—61 **4 Claims**

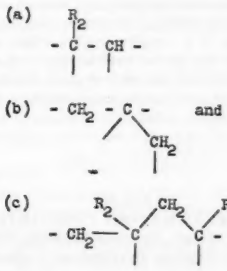
1. A cosmetic water-in-oil emulsion useful in creams for application to the skin and nails comprising in amounts effective to provide said water-in oil emulsion 30–60 weight percent water, 18–60 weight percent of an oil phase which is readily absorbable by the skin and 6.5–14 weight percent, as emulsifier, of a copolymer having the formula:



I II

wherein

A is selected from the group consisting of



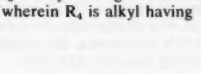
wherein

R_2 is selected from the group consisting of hydrogen and methyl;

R is selected from the group consisting of

d. alkyl having 8–18 carbon atoms,

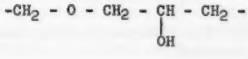
e.



wherein R_3 is alkyl having 17 carbon atoms,

f. —O—R_4 wherein R_4 is alkyl having 16 carbon atoms,

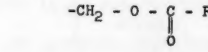
g.



wherein Y is selected from the group consisting of —O—$C_{12}H_{25}$, —S—$C_{12}H_{25}$ and —NH—$C_{18}H_{37}$

with the proviso that when R has the values of (d) to (g), R_1 is hydrogen, and

h.



wherein R_5 is alkyl having 11–17 carbon atoms,

with the proviso that when R has the value of (h), R_1 is selected from the group consisting of hydrogen and methyl, the molar ratio of monomeric units I:II is 1:1 and said copolymer has a molecular weight ranging between 4,000–100,000.

3,860,701

METHOD FOR USE AND COMPOSITIONS OF 11-LOWER ALKYL STEROIDS AND DRUG DELIVERY SYSTEM FOR THE CONTROLLED ELUTION OF 11-LOWER ALKYL STEROIDS

George E. Short, Arlington Heights, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. Nos. 723,284, April 22, 1968, Pat. No. 3,565,991, and Ser. No. 28,934, April 15, 1970,. This application Feb. 22, 1971, Ser. No. 117,704

Int. Cl. A61k *27/12;* **A61m** *31/00;* **A61k** *17/06*

U.S. Cl. 424—81 **7 Claims**

1. A drug delivery system for controlling ovulation and estrus in bovines comprising a subcutaneous implant of an effective subcutaneous implant dosage amount of an 11-lower alkyl steroidal progestational essentially devoid of estrogenic activity adsorbed in a copolymer of a major amount of a monoester of an acrylic or methacrylic acid and a minor amount of a diester of one of said acids which serves as a cross-linking agent, each monomer component being chosen such that the resultant copolymer contains at least one free hydroxy group.

3,860,702

ANTI-INFLAMMATORY COMPOSITIONS

Eugene F. Buell, Gibsonia, Richland Township, Allegheny Cty., Pa., assignor to Schuyler Development Corporation, Reading, Pa.

Filed July 11, 1972, Ser. No. 270,714

Int. Cl. A61k *27/00*

U.S. Cl. 424—94 **7 Claims**

1. An anti-inflammatory composition comprising a proteolytic enzyme from the group consisting of trypsin, chymotrypsin, papain and mixtures thereof in an amount effective to reduce inflammation admixed in partially hydrolized cocoa butter being a mixture of cocoa butter fatty acids and cocoa butter containing 5 to 50 percent unreacted cocoa butter.

3,860,703

AMIDES OF METHOBOTTROMYCIN

Frank J. Wolf, Westfield, and William J. Miller, Somerset, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 713,256, March 14, 1968, abandoned, which is a continuation-in-part of Ser. No. 480,040, Aug. 16, 1965, abandoned. This application Mar. 16, 1972, Ser. No. 235,286

Int. Cl. A61k *21/00*

U.S. Cl. 424—121 **4 Claims**

1. Methobottromycin methylamide being characterized by the following properties:

a. melting at 225°–228°C. with decomposition,

b. having a specific rotation of $[\alpha]_D^{25}$ - 23° (C 1, 95 percent ethyl alcohol),

c. having the empirical formula $C_{42}H_{63}N_9O_6S$,

d. containing 61.3% carbon, 7.68% hydrogen and 15.33% nitrogen, and

e. having an infrared absorption spectrum exhibiting characteristic peaks at the following wave lengths expressed in reciprocal centimeters: 1690, 1662, 1632, 1620, 1510, 1450, 1428, 1372, 1356, 1332, 1278, 1255, 1232, 1140, 1010, 711 and 700.

3,860,704

DRESSING FOR DRY TOOTH SOCKET

Adrian P. Gansen, Jr., 312 W. Green Bay St., Shawano, Wis. 54166

Continuation of Ser. No. 870,527, Dec. 8, 1969, abandoned, which is a continuation of Ser. No. 738,785, June 21, 1968, abandoned, which is a continuation-in-part of Ser. No. 562,535, July 5, 1966, abandoned. This application Dec. 14, 1970, Ser. No. 98,072

Int. Cl. A61k *5/00*

U.S. Cl. 424—125 **3 Claims**

1. A dental treatment composition consisting solely of the following ingredients in the following proportions:

1.2 parts procaine, 1.2 parts charcoal, 0.048 parts balsam of Peru, 0.440 parts creosote, kaolin sufficient to make a total of 120 parts, together with 10 minims of eugenol per gram of the other ingredients; said composition being a stiff putty like paste.

3,860,705

ANTIMICROBIAL COMPOSITIONS CONTAINING ALUMINUM HALIDE COMPOUNDS

Andrew M. Rubino, New Providence; William S. Gilman, South Plainfield, and John L. Jones, North Plainfield, all of, assignors to Armour Pharmaceutical Company, Phoenix, Ariz.

Filed Nov. 8, 1971, Ser. No. 196,751

Int. Cl. A01n *13/00;* **A61k** *27/00*

U.S. Cl. 424—157 **16 Claims**

1. An antimicrobial composition consisting essentially of

i. from 70 to 99.5 percent by weight of an aluminum halide compound which can be represented by the formula:

$$Al_2(OH)_nA_{6-n}Q$$

where *n* is 0–5, where A is chlorine, bromine, iodine or a mixture thereof, and Q is selected from the group consisting of water a polyhydroxy compound having at least two carbon atoms each of which is linked to a hydroxy group and mixtures of water and said compound, and where the total amount of free and coordinated constituent Q is in the range of from about 15 to 40 percent by weight of the total weight of the basic aluminum halide compound,

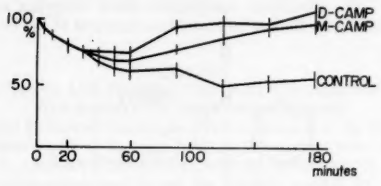
ii. from 0.25 to 20 percent by weight of a bactericidal agent selected from the group consisting of halogenated bisphenols and 2,4,4′-trichloro-2′-hydroxydiphenyl ether, and

iii. from 0.25 to 20 percent by weight of 3,4,4′-trichlorocarbanilide or 3,3′,4-trichlorocarbanilide.

3,860,706
METHOD FOR CURING SHOCK SYMPTOMS

Osamu Ikeda, and Motohiko Kato, both of Tokyo, Japan, assignors to Dauch Seiyaku Company, Limited, Chuo-ku, Tokyo, Japan

Filed May 23, 1973, Ser. No. 363,161
Claims priority, application Japan, May 24, 1972, 47-51467
Int. Cl. A01n *9/00, 9/28*
U.S. Cl. 424—180 **3 Claims**



1. Remedy for curing shock symptoms comprising a dosage of N6-2′-O-dibutyryl adenosine-3′,5′-cyclic-monophosphate or 2′-O-mono-butyryl adenosine-3′,5′-cyclic-monophosphate or a mixture thereof, said dosage being an amount effective to cure shock symptoms.

3,860,707
METHOD OF TREATING VAGINITIS

Leslie William Wootton, Kingsdown near Sevenoaks, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 9, 1973, Ser. No. 377,518
Claims priority, application Great Britain, July 18, 1972, 3351/72
Int. Cl. A61k *27/00*
U.S. Cl. 424—180 **9 Claims**

1. A method of treating women suffering from vaginitis which method comprises intravaginally administering to said women a daily effective amount of lactulose.

3,860,708
METHOD OF DELIVERING THE INTESTINES OF HUMAN BEINGS FROM BARIUMSULPHATE AFTER BARIUM MEAL EXAMINATION

Brian John Prout, Truro, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 15, 1973, Ser. No. 416,037
Int. Cl. A01n *9/00*
U.S. Cl. 424—180 **4 Claims**

1. A method of delivering the intestines of human beings from bariumsulphate after barium meal examination which method comprises administering to said human beings orally a daily effective dose of lactulose.

3,860,709
METHOD OF INHIBITING THE GROWTH OF BACTERIA AND FUNGI USING ORGANOSILICON AMINES

Eugene A. Abbott, Freeland, and Alan J. Isquith, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 184,918, Sept. 29, 1971, Pat. No. 3,794,736. This application Nov. 8, 1973, Ser. No. 414,058
Int. Cl. A01n *9/20, 9/24*
U.S. Cl. 424—184 **2 Claims**

1. A method of inhibiting the growth of bacteria or fungi by contacting said organisms with an amount effective to inhibit the growth of said organisms of an amine-functional silane selected from the group consisting of

(1) $$R_aH_{2-a}NR'SiX_mO_{\frac{3-n-m}{2}}$$ (R″ on Si)

(2) $$R_aH_{2-a}N(CH_2)_2NR'SiX_mO_{\frac{3-n-m}{2}}$$ (H and R″ on N, R″ on Si)

in which

R is a monovalent hydrocarbon radical of from 1 to 20 carbon atoms,

R′ is $-(CH_2)_3-$ or $-CH_2CH(CH_3)CH_2-$,

X is an alkoxy radical of 1 to 6 carbon atoms,

R″ is a monovalent hydrocarbon radical of 1 to 6 carbon atoms, the $CF_3CH_2CH_2-$ radical or an OH radical,

a is an integer from 0 to 2,

n is an integer from 0 to 2,

m is an integer from 0 to 3, and the sum of $m + n$ is equal to 3;

and (3) acid salts of said amines in which at least one of the amine nitrogens is converted to a salt of the formula N.HY in which

Y is an anion of a monocarboxylic acid, a strong mineral acid or a sulfonic acid.

3,860,710
METHOD OF INHIBITING VIRAL LYSIS IN NONHUMAN FLORA AND FAUNA SYSTEMS

Giovanni Giovannozzi Sermanni, and Isabella Cacciari, both of Rome, Italy, assignors to Consiglio Nazionale delle Richerche, Rome, Italy

Continuation-in-part of Ser. No. 888,163, Dec. 29, 1969, abandoned, which is a continuation of Ser. No. 654,197, July 18, 1967, abandoned. This application May 19, 1972, Ser. No. 255,241
Claims priority, application Italy, July 26, 1966, 37109/66
Int. Cl. A61k *27/00*
U.S. Cl. 424—195 **1 Claim**

1. A method of producing a substance capable of inhibiting lysis of bacteriophage virus in a nonhuman host, said method comprising the steps of:

a. cutting cladodes of *Opuntia ficus-indica* into pieces and drying same in a current of hot air at a temperature of about 60°C;

b. powdering the pieces dried in step (*a*) and extracting the powder with methanol at a temperature of about 60°C for a period of about 48 hours to produce a methanolic extract;

c. drying the methanolic extract under a reduced pressure to produce a residue;

d. suspending said residue in water and dialyzing same against water at a temperature of 4°C over a period of about three days to obtain a dialyzed substance;

e. passing the dialyzed substance through ion-exchange resin columns to eliminate acetic and basic substances, thereby obtaining a neutral effluent;

f. drying the neutral effluent under reduced pressure to obtain a second residue;

g. chromatographing the second residue on paper in butanol/water/acetic acid system consisting of butanol water and acetic acid in a ratio of about 4/2/3 and collecting the third effluent peak;

h. drying the third effluent peak under the reduced pressure to produce a third residue;

i. subject the third residue to gel filtration in a gel-filtration column and eluting the column with distilled water at a speed of about 6 milliliters per hour; and

j. collecting a noncytotoxic fraction with lysis inhibiting activity and corresponding to AV+++ of FIG. 1 of the accompanying drawing to constitute the substance capable of inhibiting lysis.

3,860,711

SYNERGISTIC INSECTICIDAL COMPOSITION CONTAINING DIPROPARGYL PHENYLPHOSPHONATE

Michael J. Grubber, Racine, Wis., assignor to S. C. Johnson & Son, Racine, Wis.

Continuation-in-part of Ser. No. 33,529, April 30, 1970, abandoned. This application Oct. 31, 1972, Ser. No. 302,449

Int. Cl. A01n *9/36*

U.S. Cl. 424—200 **12 Claims**

1. A synergistic insecticidal composition comprising dipropargyl phenylphosphonate and a phosphorous-containing insecticide selected from the group consisting of:

0,0-diethyl-0-(3,5,6-trichloro-2-pyridyl) phosphorothioate;

0,0-dimethyl-0-(3,5,6-trichloro-2-pyridyl) phosphorothioate;

dimethyl 3,5,6-trichloro-2-pyridyl phosphate;

0,0-dimethyl-S-phthalimidomethyl phosphorodithioate; and

0,0-diethyl-0-(2-isopropyl-4-methyl-6-pyrimidyl) phosphorothioate

wherein the weight ratio of the phosphorous-containing insecticide to dipropargyl phenylphosphonate is 1:4.

3,860,712

COMPOSITION AND METHOD FOR TREATMENT OF ACNE OR SEBORRHEA

Richard A. Ferrari, Bethlehem, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Apr. 16, 1973, Ser. No. 351,249

Int. Cl. A61k *17/06*

U.S. Cl. 424—240 **8 Claims**

1. A composition for treatment of acne or seborrhea which comprises from 5 to 30 percent by weight of urea, from 0.1 to 1.0 percent by weight of an unconjugated bile acid, and from 20 to 60 percent by weight of an alcohol selected from the group consisting of ethanol and isopropyl alcohol.

3,860,713

SLIME CONTROLLING COMPOSITIONS AND THEIR USE

Bernard F. Shema, Glenside; Robert H. Brink, Jr., Doylestown, and Paul Swered, Philadelphia, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 00,443, Jan. 2, 1970, Pat. No. 3,647,703. This application Oct. 14, 1971, Ser. No. 189,372The portion of the term of this patent subsequent to Mar. 7, 1989, has been disclaimed.

Int. Cl. A01n *9/02, 9/22*

U.S. Cl. 424—246 **13 Claims**

1. A method for controlling the growth of the microorganism Aerobacter aerogenes in an aqueous system in which said microorganism is found which comprises adding to said system so as to contact said microorganism an effective amount of a combination comprising 3,5-dimethyl tetrahydro-1,3,5-2H-thiadiazine-2-thione and N-(2-nitrobutyl) morpholine, wherein the weight ratio of the thione to the morpholine is from about 5 to 95 percent to about 95 to 5 percent.

3,860,714

ANTIBACTERIAL COMPOSITIONS AND METHODS

Florin Seng, Cologne-Buchheim; Kurt Ley, Odenthal-Globusch, and Karl Georg Metzger, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

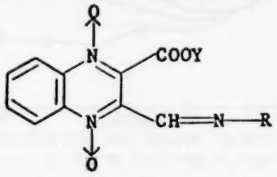
division of Ser. No. 130,007, March 31, 1971,. This application Aug. 20, 1973, Ser. No. 389,885

Claims priority, application Germany, Apr. 2, 1970, 2015676

Int. Cl. H61k *27/00*

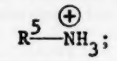
U.S. Cl. 424—250 **12 Claims**

1. An antibacterial composition which comprises an antibacterially effective amount of a compound of the formula

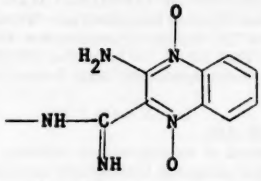


or a pharmaceutically acceptable non-toxic salt thereof wherein

Y is hydrogen, an alkali metal cation or the cation



and each of R and R^5 is



in combination with a pharmaceutically acceptable non-toxic inert diluent or carrier.

3,860,715

ANTIBACTERIAL COMPOSITIONS AND METHODS

Florin Seng, Cologne-Buchheim; Kurt Ley, Odenthal-Globusch, and Karl Georg Metzger, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

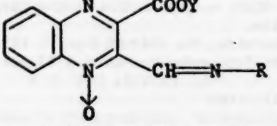
Division of Ser. No. 323,953, Jan. 15, 1973, , which is a division of Ser. No. 130,007, March 31, 1971,. This application Aug. 20, 1973, Ser. No. 389,886

Claims priority, application Germany, Apr. 2, 1970, 2105676

Int. Cl. A61k *27/00*

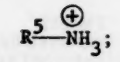
U.S. Cl. 424—250 **30 Claims**

1. An antibacterial composition which comprises an antibacterially effective amount of a compound of the formula

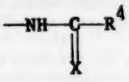


or a pharmaceutically acceptable non-toxic salt thereof wherein

Y is hydrogen, an alkali metal cation or the cation



and each of R and R^5 is



wherein

X is O, S or NH and

R^4 is phenyl, pyridyl or norbornyl, in combination with a pharmaceutically acceptable non-toxic inert diluent or carrier.

3,860,716

METHODS AND PHARMACEUTICAL COMPOSITIONS FOR INHIBITING GLUCONEOGENESIS

Charles E. Berkoff, Huntingdon Valley; Nicholas W. Di Tullio, Holmes, both of Pa., and Jerry A. Weisbach, Cherry Hill, N.J., assignors to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 131,834, April 6, 1971, abandoned. This application Mar. 13, 1972, Ser. No. 234,379

Int. Cl. A61k *27/00*

U.S. Cl. 424—266 **5 Claims**

1. A pharmaceutical composition having hypoglycemic activity, in dosage unit form, comprising a pharmaceutical carrier and an effective amount of 3-thiolpicolinic acid.

3,860,717

METHOD OF ANTIHYPERTENSIVE CHEMOTHERAPY UTILIZING 1-METHYL-3-KETO-4-PHENYL QUINUCLIDINIUM SALTS

Enrique Hong, Mexico, Mexico, assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Dec. 8, 1972, Ser. No. 313,439

Int. Cl. A61k *27/00*

U.S. Cl. 424—267 **8 Claims**

1. A method of producing an antihypertensive effect in a hypertensive mammal, which comprises

administering to said mammal an effective amount of a pharmaceutically acceptable 1-methyl-3-keto-4-phenylquinuclidinium salt.

3,860,718

IMIDAZO (2,1-b) THIAZOLE AND THIAZOLO (3,2-a) BENZIMIDAZOLE QUATERNARY SALTS HYPOGLYCEMIC AGENTS

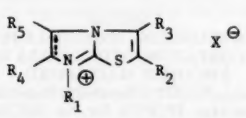
Donald E. Kuhla, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Sept. 20, 1973, Ser. No. 399,053

Int. Cl. A61k *27/00*

U.S. Cl. 424—270 **15 Claims**

1. A method for reducing the blood-sugar levels of a diabetic mammal which comprises orally or parenterally administering to said mammal a hypoglycemic amount of a compound of the formula



wherein X is a pharmaceutically acceptable anion;

R_1 is selected from the group consisting of propargyl, benzyl, phenethyl and substituted benzyl wherein said substituent is selected from the group consisting of fluoro, chloro, methoxy, trifluoromethyl, phenyl and dichloro;

R_2 is selected from the group consisting of hydrogen and alkyl containing from 1 to 3 carbon atoms;

R_3 is selected from the group consisting of hydrogen, alkyl containing from 1 to 3 carbon atoms, adamantyl, phenyl and substituted phenyl wherein said substituent is selected from the group consisting of dimethyl and dimethoxy;

R_2 and R_3 when taken together is tetramethylene;

R_4 is selected from the group consisting of hydrogen, alkyl containing from 1 to 3 carbon atoms, phenyl, dimethylphenyl and chlorophenyl;

R_5 is hydrogen; and

R_4 and R_5 when taken together with the carbon atoms to which they are attached form a 1,2-phenylene ring.

3,860,719

ANTAGONISM OF ETHANOL INTOXICATION WITH 2-[(3,4-DICHLOROPHENOXY)METHYL]-2-IMIDAZOLINE

Franklin N. Marshall, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 21, 1972, Ser. No. 317,115

Int. Cl. A61k *15/12*

U.S. Cl. 424—273 **6 Claims**

1. A method for combatting ethanol intoxication and narcosis in mammals, comprising administering internally to a mammal intoxicated or narcotized with ethanol an amount of an imidazoline compound sufficient to antagonize ethanol intoxication and narcosis, the imidazoline compound being selected from the group consisting of 2-[(3,4-dichlorophenoxy)methyl]-2-imidazoline and a pharmaceutically-acceptable salt thereof.

3,860,720

COMBATING FUNGUS DISEASES OF PLANTS WITH NAPHTHALIC ANHYDRIDE

Michael F. Covey, Shawnee, Kans., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Oct. 6, 1971, Ser. No. 187,147

Int. Cl. A01n *9/28*

U.S. Cl. 424—285 **3 Claims**

1. A method of combating *Phytopthora* and *Venturia* fungus diseases of plants which comprises applying to the locus of the plants as a foliar spray an aqueous dispersion containing an effective fungicidal amount of 1,8-naphthalic anhydride.

3,860,721

METHODS OF TREATING BILIARY LITHIASIS

Gerard C. Bulteau, Paris, France, assignor to Societe D'Etudes Scientifiques et Industrielles de L'Ile-De-France, Paris, France

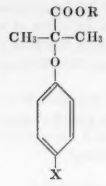
Division of Ser. No. 270,626, July 11, 1972, Pat. No. 3,790,681, Continuation-in-part of Ser. No. 124,957, March 16, 1971, abandoned, Continuation-in-part of Ser. No. 760,973, Sept. 19, 1968, Pat. No. 3,632,629. This application May 14, 1973, Ser. No. 359,678

Claims priority, application France, Nov. 22, 1967, 67.133439

Int. Cl. A61k *27/00*

U.S. Cl. 424—308 **6 Claims**

1. The method of treating biliary lithiasis in mammals to suppess the biliary lithiasis in the mammal treated which comprises administering to a mammal, orally or parenterally, a daily dosage of 10 to 360 mg/kg of body weight of the mammal treated a fluorinated derivative of an ester of phenoxy isobutyric acid of the formula:



in which R is a straight or branched chain alkyl having 1 to 5 carbon atoms and X is trifluoromethyl, trifluoromethylthio, trifluoromethylsulfinyl or trifluoromethylsulfonyl.

3,860,722

HYPOLIPIDEMIC AGENTS

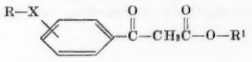
J. Martin Grisar, and Roger A. Parker, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., New York, N.Y.

Filed Sept. 22, 1972, Ser. No. 291,235

Int. Cl. A61k *27/00*

U.S. Cl. 424—308 **13 Claims**

1. A method of reducing the lipid concentration in the blood of a patient in need thereof which comprises administering orally or parenterally to said patient an effective hypolipidemic amount of a compound selected from the group consisting of a compound of the formula



wherein the substituent group represented as R-X is attached at the meta- or para- position of the phenyl ring, and wherein X is oxygen or divalent sulfur; R is a straight or branched alkyl chain of from 10 to 17 carbon atoms; and R^1 is hydrogen, a straight or branched lower alkyl chain of from 1 to 4 carbon atoms, or phenylalkyl wherein the alkyl moiety contains from 1 to 4 carbon atoms; and a pharmaceutically acceptable salt thereof.

3,860,723

METHODS AND COMPOSITIONS FOR INCREASING FEED INTAKE OF ANIMALS

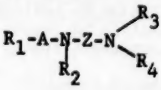
Clifton A. Baile, Glen Mills; Carol Lynn McLaughlin, Malvern, and Robert Lee Webb, West Chester, all of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 224,987, Feb. 9, 1972, abandoned. This application Aug. 7, 1973, Ser. No. 386,462

Int. Cl. A61k *27/00*

U.S. Cl. 424—321 **9 Claims**

1. The method of increasing feed intake and efficiency of healthy ruminant animals comprising administering internally to said animals not in need of therapeutic treatment an effective but nontoxic quantity of a phenylalkylsulfamide or phenylalkylurea compound of the formula:



in which:

R_1 is phenyl, chlorophenyl, bromophenyl, fluorophenyl, nitrophenyl, or trifluoromethylphenyl;

A is a lower alkylene having from 2 to 4 carbon atoms;

R_2, R_3, R_4 are hydrogen or lower alkyl having from 1 to 6 carbon atoms; and

Z is SO_2 or CO.

3,860,724

SUBSTITUTED SULFONYL UREA AND ITS STEREOISOMERS AS HYPOGLYCEMIC AGENTS

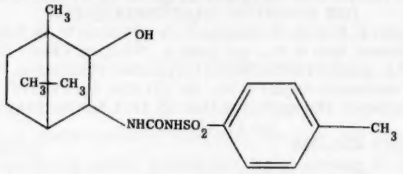
Hermann Bretschneider; Klaus Grassmayr; Kraft Hohenlohe-Oehringen, all of Innsbruck, Austria, and Andre Grussner, Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 184,902, Sept. 29, 1971, Pat. No. 3,787,491, which is a continuation-in-part of Ser. No. 675,796, Oct. 17, 1967, abandoned. This application Oct. 10, 1973, Ser. No. 404,955

Int. Cl. A61k *27/00*

U.S. Cl. 424—321 **2 Claims**

1. A method of lowering blood sugar levels in warm-blooded animals in need thereof which comprises administering orally to said warm-blooded animals an effective amount of a compound of the formula



3,860,725

PROCESS FOR THE TREATMENT OF COCONUT AND PRODUCTS RESULTING THEREFROM

John H. Forkner, Fresno, Calif., assignor to The Pillsbury Company, Minneapolis, Minn.

Continuation-in-part of Ser. No. 240,191, March 31, 1972, abandoned. This application Feb. 26, 1973, Ser. No. 335,688

Int. Cl. A23b *7/08;* **A23l** *1/06, 1/36*

U.S. Cl. 426—44 **12 Claims**

1. In a process for the treatment of particulate coconut meat characterized by aligned rod-like cells arranged in cell bundles, immersing the coconut meat in a water solution of a physiologically acceptable acid at an elevated temperature and at a pH and for a period of time sufficient to effect disruption of the cells and loosening of the cells with respect to each other thereby tenderizing and promoting absorptivity of the meat, causing residual acid of the meat to be neutralized and free liquor to be removed to provide moist tenderized coconut meat, and subjecting the moist tenderized meat to disintegration to form a paste or mash, and incorporating the mash with another edible sugar containing material.

3,860,726

PROCESS FOR PRODUCING DIGESTIBLE PUREE FROM THE FRUIT CONTAINING STONE CELLS WITH HIGH VISCOSITY MAINTAINED

Akiyoshi Yamane, No. 557-1 Yonebara, Tattori-ken, Japan

Filed Mar. 27, 1973, Ser. No. 345,334

Claims priority, application Japan, Mar. 30, 1972, 47-31913

Int. Cl. A23l *1/06*

U.S. Cl. 426—52 **5 Claims**

1. A process for producing a digestible puree from a fruit containing stone cells, said process comprising forming a puree, adding peptidase to said puree, and separating said stone cells from said puree.

3,860,727
PERFUME AND FLAVORED COMPOSITIONS CONTAINING ETHYL 2,4-DIOXOHEXANOATE
Zoltan G. Hajos, Upper Montclair, and David R. Parrish, Glen Ridge, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
Division of Ser. No. 4,134, Jan. 19, 1970, Pat. No. 3,760,087. This application Apr. 12, 1973, Ser. No. 350,662
Int. Cl. A23l *1/26*
U.S. Cl. 426—65 **3 Claims**

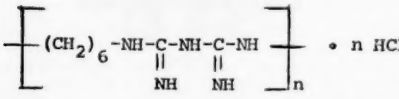
1. A flavored composition comprising an effective amount of ethyl 2,4-dioxohexanoate as a flavoring ingredient in a food.

3,860,728
CARAMEL-CONTAINING COLLAGEN SAUSAGE CASING AND SMOKED SAUSAGE
Alistair Gilmour Tanner, Milngavie, and James Tarleton Wallace, Glasgow, both of Scotland, assignors to Devro, Inc., Somerville, N.J.
Filed Apr. 5, 1973, Ser. No. 348,375
Int. Cl. A22c *11/00, 13/00*
U.S. Cl. 426—105 **10 Claims**

1. An edible caramel-containing hide collagen sausage casing wherein the caramel is distributed substantially uniformly throughout the casing and wherein the caramel is present in an amount of from 1 to 10 percent by weight based on the total casing weight and wherein the caramel and collagen are interreacted to form a strongly bound complex from which the caramel is not detached from the collagen when the casing is subjected to subsequent cooking.

3,860,729
PRESERVATION OF BEVERAGES WITH POLY(HEXAMETHYLENEBIGUANIDE HYDROCHLORIDE)
Frede B. Strandskov, North Caldwell, and John B. Bocklemann, Tenafly, both of N.J., assignors to The F. & M. Schaefer Brewing Company, Brooklyn, N.Y.
Filed Oct. 5, 1973, Ser. No. 403,970
Int. Cl. A23l *3/34*
U.S. Cl. 426—151 **14 Claims**

1. A method of preserving a beverage selected from the group of fruit and vegetable juices, soft drinks and light alcoholic beverages against undesirable microbial growth which comprises incorporating into the beverage prior to packaging the polymeric biguanide material of the formula



wherein *n* is such that the average molecular weight lies between 900 and 1,300

the amount of the polymeric biguanide incorporated being sufficient to preserve the beverage against undesirable microbial growth.

3,860,730
CHOCOLATE POWDER
Brian T. Warkentin, Sunnyvale, Calif., assignor to Chocolate International, Inc., Belmont, Calif.
Filed Aug. 9, 1973, Ser. No. 386,974
Int. Cl. A23g *1/00*
U.S. Cl. 426—174 **2 Claims**

2. A chocolate powder suitable for the preparation of chocolate milk drinks characterized by extended shelf life consisting essentially of the product obtained by the process comprising the steps of

a. dry blending a quantity of cocoa powder, 6 to 15 percent by weight, based on the cocoa powder, of starch, 1 to 5 percent by weight, based on the cocoa powder, of sugar, 5 to 15 percent by weight, based on the cocoa powder, of whey powder and 2 to 4 percent by weight, based on the cocoa powder, of carrageenin,

b. dissolving the mixture produced in step (a) in water to form a syrup having a solids content in the range 20 – 30 percent by weight,

c. heating the syrup to about 145°F. and maintaining it at that temperature for at least 30 minutes,

d. cooling the syrup to about 50° – 75°F. and maintaining it at such temperature for at least 10 hours to permit germination of endospores contained in the cocoa powder,

e. adding concentrated hydrogen peroxide to the syrup in amount sufficient to give the syrup a hydrogen peroxide content in the range about 1 to 2 percent by weight,

f. heating the syrup containing hydrogen peroxide to a temperature 80° – 100°F. and maintaining it at such temperature for at least 10 – 20 hours,

g. then heating the syrup to a temperature in the range 180° – 200°F. and maintaining it at such temperature for at least ten minutes,

h. cooling the syrup to about 50° – 75°F. and adding catalase to the syrup in amount sufficient to give the syrup a catalase content in the range 0.2 to 2.0 percent by weight and maintaining the syrup containing added catalase at about 50° – 75°F. for about one hour to decompose residual hydrogen peroxide and

i. spray drying the syrup at a temperature at least 150°F. to produce a chocolate powder having a water content below about 7 percent by weight.

3,860,731
COCOANUT FOOD PRODUCT AND METHOD
John H. Forkner, Fresno, Calif., assignor to The Pillsbury Company, Minneapolis, Minn.
Continuation-in-part of Ser. No. 240,191, March 31, 1972, abandoned. This application Feb. 26, 1973, Ser. No. 335,834
Int. Cl. A23l *1/36;* **A23b** *7/08*
U.S. Cl. 426—199 **26 Claims**

1. In a process for the treatment of pieces of coconut meat characterized by aligned rod-like cells arranged in cell bundles, immersing the pieces of coconut meat in a water solution of a physiologically acceptable acid at an elevated temperature and at a pH and for a period of time sufficient to effect disruption of the cells and loosening of the cells with respect to each other thereby tenderizing and promoting absorptivity of the pieces, causing residual acid of the pieces to be neutralized and free liquor of the batch to be removed to provide edible moist tenderized coconut pieces, and then contacting the moist tenderized coconut pieces with a liquid impregnating material having edible constituents whereby the pieces are impregnated by the liquid material.

3,860,732
SALT SUBSTITUTE
Benjamin Eisenstadt, Brooklyn, N.Y., assignor to Cumberland Packing Corp., Brooklyn, N.Y.
Filed Mar. 30, 1970, Ser. No. 23,986
Int. Cl. A23l *1/22*
U.S. Cl. 426—219 7 Claims

1. A sodium-free salt substitute, consisting essentially of a sodium-free salt selected from the group consisting of potassium chloride and a mixture of potassium chloride and ammonium chloride, at least one substance selected from the group consisting of lactose and dextrose in an amount of about one-tenth and one-third the amount of said sodium free salt by weight, and cream of tartar in an amount of about one five-hundredth and one one-hundredth the amount of said sodium free salt by weight.

3,860,733
MICROENCAPSULATED PRODUCT
Lewis D. Morse, Princeton, and Paul A. Hammes, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.
Continuation-in-part of Ser. No. 207,575, Dec. 13, 1971, abandoned, which is a continuation-in-part of Ser. No. 30,969, April 22, 1970, abandoned. This application July 31, 1972, Ser. No. 276,870
Int. Cl. A23l *1/34*
U.S. Cl. 426—302 10 Claims

1. The method of maintaining the uniformity of a mixture of discrete nutrients while microencapsulating these nutrient which comprises mixing together a solvent and the following per 100 grams of the solvent:

1 to 5 grams of ethylcellulose having a 45 to 50 percent ethoxyl content and a 95–110 cps. viscosity; and

1 to 50 grams of discrete particles of unattached mixed nutrients which are less than 100 microns in size; heating the mixture to about 80°C. to dissolve the ethylcellulose in the solvent, allowing the system to cool during continued stirring whereby the ethylcellulose develops encapsulating walls around a plurality of discrete nutrient particles, and separating and recovering the nutrient-containing microcapsules in which the nutrients remain discrete.

3,860,734
ESSENCES OF FRESH POT-HERBS AND PROCESS FOR PREPARING SAME
Heinz Huth, and Klaus Werner, both of Holzminden, Germany, assignors to Dragoco Gerberding & Co. GmbH, Holzminden, Germany
Filed Feb. 1, 1973, Ser. No. 328,549
Claims priority, application Germany, Feb. 24, 1972, 2208815
Int. Cl. A23l *1/22*
U.S. Cl. 426—369 7 Claims

1. A method of producing substantially sterile, lasting essences of fresh pot-herbs comprising comminuting frozen pot-herbs, pressing the comminuted herbs at a temperature no greater than a few degrees above the freezing point of water to express liquid therefrom and to form a press cake, treating the press cake with concentrated acetic acid, pressing the treated cake to express acetic acid extract therefrom, and combining the expressed liquid and acetic acid extract.

3,860,735
METHOD OF MANUFACTURING NON-GLUTINOUS RICE CRACKERS
Hiroshi Hoshino, 9-9, 1-chome, Maeda, Nagaoka-shi, Niigata-ken, Japan
Filed Feb. 26, 1973, Ser. No. 335,512
Int. Cl. A23l *1/10*
U.S. Cl. 426—458 3 Claims

1. A method of manufacturing non-glutinous rice crackers comprising the steps of:

milling non-glutinous rice;

mixing the resultant rice powder with water and kneading the mixture while adding steam until a soft paste is formed;

immersing the resultant smothered paste in water at a sufficient temperature and time for cooling the paste to remove its harshness,

rolling the resultant paste into a strip-like form,

feeding the resultant strip-like paste to a dehydrator held at a temperature of 60° to 90° C. for a period of time sufficient to reduce the water content of the paste down to 20 to 24 percent,

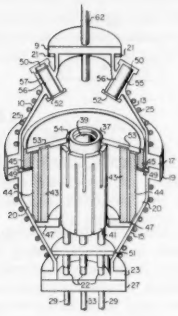
cutting the dehydrated paste in a continuous high-speed cutting process, and

thereafter drying to reduce water content in the paste pieces down to 12 percent and baking the resultant paste pieces.

3,860,736
CRYSTAL FURNACE

William M. Ford, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 29, 1973, Ser. No. 410,852
Int. Cl. F27b *14/04*
U.S. Cl. 13—20 2 Claims

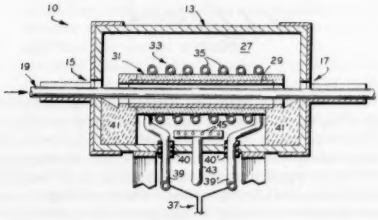


1. A crystal growing furnace, comprising:
a chamber having internal walls and external walls;
a crucible disposed inside the chamber for containing a crystal melt;
means supporting said crucible for selectively moving said crucible inside said chamber;
a resistance heater surrounding the crucible;
baffle means surrounding the heater and crucible for conserving heat;
an internal plate within the chamber in cooperating disposition with the baffle means for defining a heat-conserving zone around the heater and below said plate and for establishing an upper region above said plate, said internal plate having an opening through which the crucible may pass into and above the heat-conserving zone.

3,860,737
FURNACE AND METHOD FOR INDUCTION HEATING MOVING QUANTITIES OF MATERIAL

Charles L. Moscatello, Sayre, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 11, 1974, Ser. No. 432,571
Int. Cl. H05b *5/00*
U.S. Cl. 13—27 11 Claims

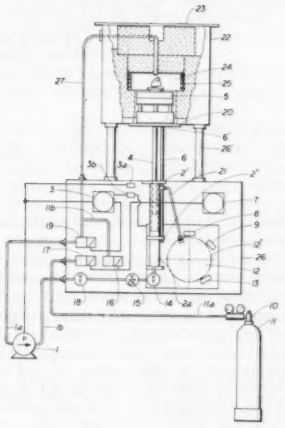


1. A high temperature induction furnace for heating a quantity of material passing therethrough, said furnace comprising:
a housing member defining a chamber, said housing member comprised of a thermally conductive material and having an inlet port and exit port therein;
a tubular susception member within said chamber, said susceptor member positioned relative to said inlet and exit ports and adapted for having said quantity of material pass therethrough;
a refractory medium positioned substantially about said tubular susceptor member; and
means within said chamber and substantially about said refractory medium for inducing electrical current within said tubular susceptor member and for cooling said tubular susceptor member and said refractory medium.

3,860,738
FIRING OVEN FOR CERAMIC MATERIAL

Karl Hintenberger, Krogerstr. 4, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 246,642, April 24, 1972, abandoned. This application Mar. 13, 1973, Ser. No. 340,719
Claims priority, application Germany, Apr. 27, 1971, 2120592
Int. Cl. H05b *3/66*
U.S. Cl. 13—31 2 Claims



1. In an oven for firing ceramic material, which comprises an electrical circuit operable with a pneumatic circuit, a thermally insulated and vacuum-tight electrically heated shell defining a vertical firing chamber therein, the shell having a closed top and a bottom opening connecting the chamber with the ambient atmosphere, a sealing plate mounted outside the shell in alignment with the chamber opening, a pneumatically operable lifting rod supporting the sealing plate and vertically reciprocable to move the sealing plate into and out of sealing engagement with the chamber opening, evacuating means for withdrawing air from the firing chamber when the chamber opening has been sealed, and a carrier for the ceramic material mounted on the sealing plate and spaced therefrom to carry the ceramic material into the chamber when the sealing plate is vertically upwardly moved, the improvement of an additional, mechanically driven lifting element for the sealing plate, the additional mechanically driven lifting element being arranged to be vertically reciprocable between a first position in detachable engagement with the sealing plate and a second position vertically removed therefrom, and programming means for reciprocating the additional mechanically driven lifting element between said positions, said programming means having a crank drive linked to the additional mechanically driven lifting element.

3,860,739

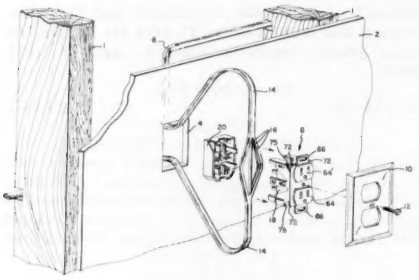
METHOD AND APPARATUS FOR A WIRING SYSTEM UTILIZING WIRING DEVICES

James Albert Kloth, St. Petersburg; Stuart L. Parsons, Clearwater, both of Fla.; John Aaron Zimmerman, Jr., Hershey, Pa., and George Henry Vigeant, deceased, late of St. Petersburg, Fla. (by Mrs. George Henry Vigeant, executrix), assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 168,655, Aug. 3, 1971, abandoned. This application Oct. 26, 1972, Ser. No. 300,931

Int. Cl. H02g *3/12*

U.S. Cl. 174—48 25 Claims



4. In the combination of a multi-conductor electrical cable having the individual conductors thereof terminated in an electrical wiring device having a housing and a separable cover of insulation material and a releasable means for retaining the housing and cover in assembled relationship, the improvement comprising: longitudinally sliced portions of an outer sheath of said cable, medial portions of the individual conductors of said cable being exposed through said longitudinally sliced portions of the outer sheath of said cable, the medial portions of the individual conductors being spread apart together with said longitudinally sliced portions of said outer sheath remaining on said individual conductors, cable receiving openings in opposite sides of said housing receiving unsliced portions of said electrical cable, said housing internally receiving the spread apart medial portions of the individual conductors together with the spread apart longitudinally sliced portions of said outer sheath, electrical terminals in said housing projecting portions of said housing located between said wire receiving openings and initially retaining said spread apart medial portions of the individual conductors in desired overlying positions with respect to said electrical terminals prior to and after assembly of said separable cover to said housing, said unsliced portions of said electrical cable outer sheath being on either side of said exposed medial portions of said individual conductors and being received and retained in said cable receiving openings prior to an after assembly of said separable cover to said housing, said separable cover including portions protruding toward said spread apart medial portions of the individual conductors and forcibly urging said medial portions of the individual conductors together with the spread apart longitudinally sliced portions of said outer sheath into engagement with said electrical terminals with said individual conductors being forcibly urged into electrical termination with said electrical terminals, and said releasable means releasably retaining said housing and said separable cover in assembled relationship, thereby enclosing said spread apart medial portions of the individual conductors internally of said electrical wiring device.

3,860,740

ENCAPSULATED COMPONENTS

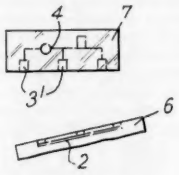
David Vaughan Watkins, 66, Bedford Gardens, London, W. 8, England

Filed Mar. 9, 1973, Ser. No. 339,952

Claims priority, application Great Britain, Mar. 14, 1972, 11903/72

Int. Cl. H05k *5/06*

U.S. Cl. 174—52 PE 4 Claims



1. Electrical or electronic apparatus comprising a block of clear plastic material, said block having smooth machined surfaces, at least one electrical or electronic component encapsulated in said block, conductor leads connected to said at least one component, said leads being within said block, enlarged metal end portions of at least 2 mm. transverse breadth connected to said conductor leads, said end portions being located at a said block surface and being of soft metal machinable simultaneously and with the same tools as said plastic material, said block and said end portions having been machined such that said surfaces are smooth and said enlarged end portions have smooth faces in a said surface, whereby external electrical lead connections to said at least one component can be readily effected by connection to said enlarged end portions.

3,860,741

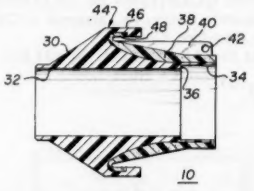
STRESS CONE

Arthur M. Troccoli, Old Bridge, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Jan. 18, 1974, Ser. No. 434,549

Int. Cl. H02g *15/02*

U.S. Cl. 174—73 R 3 Claims



1. A stress cone for terminating the electrically conductive shield of a high voltage cable having a central conductor, insulation covering said conductor, an electrically conductive shield surrounding said insulation and a plurality of concentric neutral wires wrapped thereabout, a portion of said electrically conductive shield being removed and providing a terminal rim, said cone comprising: an elongate hollow inner member molded of electrically insulating elastomeric material, said inner member having an outer surface flaring outwardly from each end generally towards the mid region of said inner member, said inner member having a central passage therethrough proportioned to resiliently receive therein the portion of said cable from which the electrically conductive shield had been removed, said inner member further comprising a terminal shoulder adjacent said central passage for receipt thereagainst

of said terminal rim of said electrically conductive shield, said inner member terminating in an annular portion contiguous therewith and extending from said terminal shoulder to one end of said inner member, said annular portion being proportioned to provide an additional passage communicating with said central passage to resiliently receive therein the electrically conductive shield of said cable; an outer member of resilient electrically conductive elastomeric material molded around at least a portion of said inner member, said outer member having a skirt portion overlying said inner member annular portion, the entire junction between said inner member and said outer member being void free; and means conductively contiguous with said outer member for receiving therein at least one of said plurality of concentric neutral wires.

3,860,742

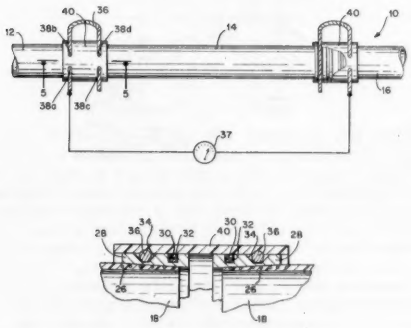
CONNECTION OF PLASTIC PIPES WITH GROUND WIRES EMBEDDED THEREIN

Jonas Medney, 3504 Woodward St., Oceanside, N.Y. 11572

Filed Apr. 4, 1973, Ser. No. 347,871

Int. Cl. H02g *15/08*

U.S. Cl. 174—84 S **14 Claims**



1. An electrically conductive insulator plastic pipe system comprising:

a. at least two rigid adjacent tubular sections made of resin bonded glass fibers each being defined by an elongated, non-conductive wall including a central portion having axially spaced apart first and second ends;

b. conductive wire means completely embedded within each said wall along said central portion thereof and extending between said first and second ends, said conductive wire means being exposed only proximate each said first and second ends; and

c. external, axially elongated, annular coupling means mechanically coupling two adjacent ones of said tubular sections and electrically coupling said exposed conductive wire means to said two adjacent ends of said tubular sections, said annular coupling means extending at least partially over said two adjacent tubular sections, wherein said annular coupling means comprises an electrically conductive sleeve positioned about each said first and said second end, said conductive sleeve being in electrical contact with said exposed conductive wire means, a tubular member extending over said sleeves of said two adjacent ones of said tubular sections, and a conductor in engagement with said tubular member and said sleeves, said conductor being in electrical contact with said two adjacent ones of said sleeves whereby there is electrical continuity between said two adjacent ones of said tubular sections.

3,860,743

CABLE SPLICE HOUSING

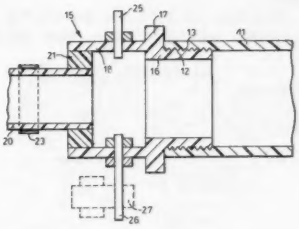
Owen Winram Worden, 2809 Uplands Cres., Abbotsford, British Columbia, Canada

Filed Oct. 19, 1972, Ser. No. 298,914

Claims priority, application Canada, Apr. 14, 1972, 139691

Int. Cl. H02g *15/08*

U.S. Cl. 174—93 **2 Claims**



1. A cable splice housing, comprising:

a. a central section having an internal diameter larger than the diameter of the cables to be spliced;

b. a closure member having an opening for accommodating a cable therethrough;

c. said closure member threadedly engaged with corresponding threaded means on one end of said central section;

d. said closure member being provided with a flexible tube portion sealed thereto around said opening;

e. means for clamping the tube portion in sealed relation around the cable to seal the closure member to the cable;

f. said closure member having an externally projecting annular flange in abutment with the end of the central section; and

g. an annular plastic plug provided between and sealed to one end of the tube portion and one end of the closure member, the central opening of said annular plug constituting said opening for accommodating the cable.

3,860,744

INSULATED CONDUCTOR BAR STRUCTURE FOR STATOR WINDING OF HIGH-VOLTAGE DYNAMO-ELECTRIC MACHINE

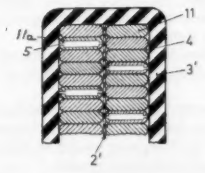
Roland H. Schuler, Wettingen, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed June 13, 1973, Ser. No. 369,467

Claims priority, application Switzerland, June 20, 1972, 9181/72

Int. Cl. H01b *7/08*

U.S. Cl. 174—117 FF **12 Claims**



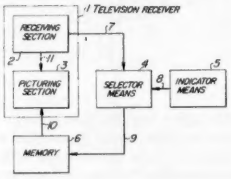
1. In a conductor bar structure for forming the stator winding of a high-voltage dynamo-electric machine which comprises at least one stack of contiguous bar type bare conductors, each conductor of the stack having an elongated essentially rectangular cross-section and which is enclosed within a sheath of insulating material, the improvement wherein the narrow sides of said conductor bars profiled to establish longi-

tudinally extending flow channels between the narrow sides of said conductor bars and the surface of said insulating sheath to facilitate penetration of an impregnating resin.

3,860,745
INFORMATION SELECTING AND DISPLAYING APPARATUS

Shohei Takada, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 12, 1971, Ser. No. 123,746
Claims priority, application Japan, Mar. 24, 1970, 45-24591
Int. Cl. H04n 7/08
U.S. Cl. 178—5.6 **3 Claims**



1. An information selecting and displaying apparatus comprising:

transmitter means for repeatedly sending out a series of signals carrying a multiplicity of different pieces of display information, said series of signals including a start signal inserted at the start thereof, each of said signals carrying a piece of display information including a display information signal part and a plurality of number signal parts representing the numbers of predetermined ones of said series of signals carrying predetermined ones of said multiplicity of pieces of display information and including a synchronizing signal;

receiver means for receiving said series of signals and separating said start signal and said synchronizing signals from said series of signals;

counter means, connected to said receiver means, for counting the number of said synchronizing signals appearing after said start signal;

first gate means, connected to said receiver means, for selecting a signal carrying a desired piece of display information from among said series of signals;

separator means, connected to said first gate means, for separating said number signal parts from said signal selected by said first gate means;

first register means, connected to said separator means, for storing said numbers represented by said number signal parts;

displaying means, connected to said separator means, for displaying the display information signal part contained in said selected signal;

answering means for allowing alternative answers to be given to said displayed information on said displaying means;

second gate means, connected to said first register means and said answering means, for selecting one of said numbers in said first register means in accordance with an answer by said answering means;

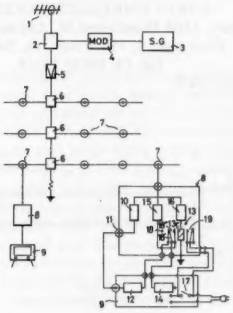
second register means, connected to said second gate means, for storing said number selected by said second gate means; and

comparator means, connected to said counter means and said second register means, for comparing the number in said counter means with the number in said second register means to produce a coincident signal to be applied to said first gate means for operating said first gate means.

3,860,746
URGENCY ANNOUNCING APPARATUS

Takeshi Takeuchi, Yokohama, Japan, assignor to Hochiki Corporation, Tokyo, Japan

Filed May 21, 1973, Ser. No. 362,252
Claims priority, application Japan, May 20, 1972, 47-49546; May 20, 1972, 47-58388; May 20, 1972, 47-58389
Int. Cl. H04n 7/18
U.S. Cl. 178—5.6 **6 Claims**



1. An urgency announcing apparatus for use in a wired television signal transmitting system having a head end and trunk lines leading to subscribers television sets comprising modulating means for converting alarm signals into frequencies in the radio frequency band, a mixing means which receives broadcast television signals and said converted alarm signals from said modulating means, control means operatively connected to said mixing means, said control means including a first filter means passing only broadcast television signals, second filter means passing only converted alarm signals, first and second relay switches controlled by the output from said second filter means, an intermediate frequency amplifier means, said first switch having a first normal operable position providing a first connection to said intermediate frequency amplifier means to relay broadcast television signals via said fist filter means, said first switch having a second alarm position in which said first connection is terminated and a second connection is established between the output of said second filter means and said intermediate frequency amplifier to relay alarm signals, said second switch having a normal position which disconnects a power source from the television set and an alarm position which connects said power source to the television set while by-passing the normally operated on-off switch on the television set, whereby converted alarm signals from said mixing means pass to the television set via said second filter means, said first switch, and said intermediate frequency amplifier means to interrupt any television broadcast signals regardless of the position of the manually operated on-off switch on the television set.

3,860,747

FACSIMILE TRANSMITTER-RECEIVER COMPRISING LIGHT SOURCE AND PHOTOELECTRIC DEVICE ALIGNED WITH AXIS OF ROTATION OF PHOTO-SENSING AND RECORDING DISK

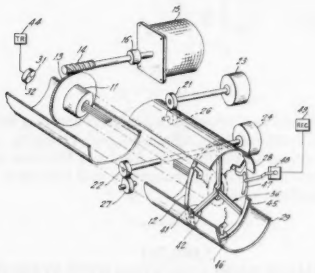
Masayoshi Orii; Takayuki Saito; Ryuji Saito; Susumu Kawase; Tsutomu Mashizu, and Masayoshi Watanabe, all of Tokyo, Japan, assignors to Nippon Telegraph Telephone Public Corporation and Nippon Electric Company Limited, Tokyo, Japan

Filed Dec. 26, 1972, Ser. No. 318,242

Claims priority, application Japan, Dec. 24, 1971, 46-2283; Dec. 24, 1971, 46-2284

Int. Cl. H04n 1/24

U.S. Cl. 178—6 10 Claims



1. A combination of facsimile transmitter and receiver including a transmitter responsive to a photoelectric signal derived from an original picture for producing a facsimile transmission signal representative of said original picture, and a receiver responsive to said facsimile transmission signal representative of the original picture for generating a reproduction signal representative of the last-mentioned original picture for reproducing the last-mentioned original picture on a recording medium, wherein the improvement comprises:

a rotor having a substantially cylindrical peripheral surface and rotatable about a predetermined axis,

a sheet-like member feeder for simultaneously linearly feeding a first and a second sheet-like member along said peripheral surface parallel to said axis with one surface of each of said members being held facing said peripheral surface and with a predetermined gap provided between said one surface of said first member and said peripheral surface and a space left between each pair of adjacent side edges of said members, said first member having an original picture on said one surface, said one surface of said second member serving as said recording medium,

a light source and a photoelectric device fixed relative to and substantially aligned with said axis,

a light conductive device positioned along said axis and rotor for guiding the light emitted by said light source to at least one first point predetermined with respect to said peripheral surface to project said light onto said surfaces of said members and for directing light reflected from said one surface of said first member towards said photoelectric device, said photoelectric device being capable of producing said photoelectric signal, and

a recording device mounted upon said rotor and being located thereon at a second point predetermined in relation to said rotor peripheral surface so as to be engageable only with said second member and responsive to said reproduction signal for reproducing that original picture on said recording medium, which the last-mentioned reproduction signal is representative of, said rotor including means for coupling said reproduction signal to said recording device only when said recording device traverses said second member.

3,860,748

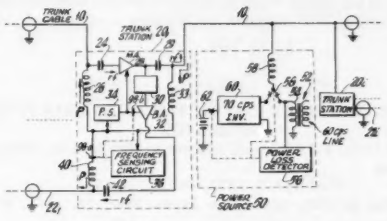
CATV PRIMARY AND AUXILIARY POWER DISTRIBUTION APPARATUS

Norman Everhart, Richboro; James Herman, Hatboro, and William Meise, Southampton, all of Pa., assignors to Jerrold Electronics Corp., Horsham, Pa.

Filed June 20, 1973, Ser. No. 371,596

Int. Cl. H04h 7/12

U.S. Cl. 178—6 8 Claims



1. In combination in a cable video distribution system, at least one power source means connected to the cable, said power source means including means for quiescently supplying line voltage of standard frequency to said cable, a storage battery, means connected to said battery for generating a standby alternating current potential at a standby power frequency different than said standard frequency, switching means for connecting a selected one of said line voltage or said standby potential to system cabling, and power loss detector means responsive to a loss of line voltage for signalling said switching means to connect the output of said standby potential supplying means to the cable system, further comprising at least one trunk repeater station connected to the cable system, said trunk station comprising a main line amplifier for locally regenerating the video signal on the cable system, a power supply for energizing said main amplifier, a feeder line output port, a power receiving input port, controlled switching means normally connecting said power input port and said feeder line output port, and frequency sensing means responsive to power received by said trunk station at the standby rate for signalling said switching means to operatively disconnect said power input port and said feeder line output port.

3,860,749

METHOD AND DEVICE FOR THE PRODUCTION OF PRINTING STENCILS

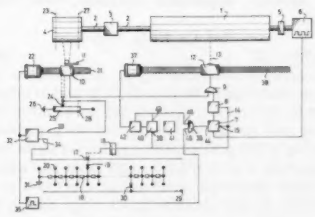
Josef Kolerus, and Hans Peterschinegg, both of Vienna, Austria, assignors to Peter Zimmer, Kufstein, Austria

Filed Mar. 19, 1973, Ser. No. 342,885

Claims priority, application Austria, Mar. 24, 1972, 2592/72

Int. Cl. H04n 1/24

U.S. Cl. 178—6.6 B 25 Claims



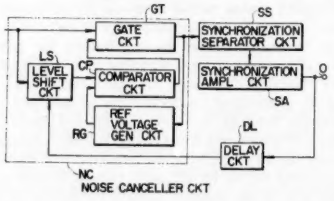
1. A method of the production of printing matrices with the aid of at least one light-sensitive layer applied to a matrix or

a matrix support, wherein the exposure of the uppermost, light-sensitive layer is effected by the consecutive projection of at least one group of pattern-dictated raster dots in the peripheral direction of the matrix or the matrix support, producing a length of said pattern, said lengths being determined in relation to a cylinder-generating length, and subdivided into a given number of equal fractional areas that is dependent on the raster-number selected and on the total of photo-cells present in the optical recording head, as well as on the focal length of the latter, the fractional areas being arranged to be sensed in succession in the peripheral direction with the optical recording head immobile and rotating a pattern carrying roller.

3,860,750
NOISE CANCELLER CIRCUIT FOR TELEVISION SYNC SEPARATOR

Seiichi Ueda, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 2, 1973, Ser. No. 346,895
Claims priority, application Japan, Mar. 31, 1972, 47-31675
Int. Cl. H04n *5/08, 5/21*
U.S. Cl. 178—7.3 S **9 Claims**



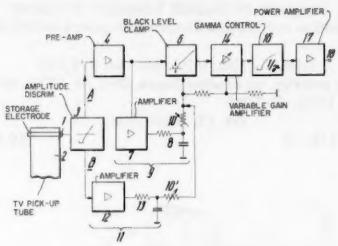
1. In a noise canceller circuit for television including comparison means for comparing the level of a compound video signal with a reference level and cancelling means for cancelling those portions of said compound video signal whose amplitude exceeds said reference level, the improvement comprising level shift means for increasing said reference level only during periods when said compound video signal includes a synchronization pulse, a synchronization separator circuit connected to receive said compound video signal, and delay means connected between the output of said synchronization separator circuit and said level shift means for actuating said level shift means with a delay.

3,860,751
METHOD AND ARRANGEMENT FOR COMPENSATING FOR STRAY LIGHT EFFECTS IN TELEVISION CAMERAS

Hans-Dieter Schneider, Gross-Gerau, Germany, assignor to Robert Bosch Fernsehanlagen GmbH, Darmstadt, Germany

Filed Nov. 6, 1973, Ser. No. 413,227
Claims priority, application Germany, Nov. 10, 1972, 2255027
Int. Cl. H04n *5/16*
U.S. Cl. 178—7.2 **10 Claims**

1. In a television camera having an optical system, a storage electrode accumulating charge varying in part as a function of stray light in said optical system, and an electron beam for discharging said storage electrode thereby generating a TV signal, having a first portion within a desired signal range and a second portion in an overdrive signal range and wherein said electron beam discharges said storage electrode to charges corresponding to said desired signal range during blanking intervals, said television camera further having clamping circuit means for clamping the black level of said television signal to a determined level, a method for compensating for stray light in said optical system, comprising, in combination, the steps of creating a first compensation signal varying as a function of a determined characteristic of said first portion of said television signal; creating a second compensation signal varying as a function of a determined characteristic of said

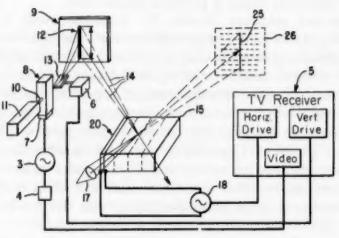


second portion of said television signal; and applying said first and second compensation signals to said clamping circuit means for varying said determined level as a function thereof and in a direction opposing changes in said television signal caused by said stray light.

3,860,752
VIRTUAL IMAGE DISPLAY SYSTEM WITH STEREO AND MULTI-CHANNEL CAPABILITY

Robert Adler, Northfield, and Adrianus Korpel, Prospects Heights, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Continuation of Ser. No. 121,302, March 5, 1971, abandoned. This application Jan. 26, 1973, Ser. No. 327,059
Claims priority, application Canada, Dec. 6, 1971, 129413
Int. Cl. H04n *5/74, 9/12, 9/58*
U.S. Cl. 178—7.3 D **4 Claims**



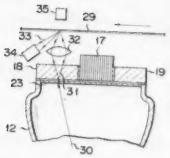
1. A virtual image viewing system including a component to be worn by an observer in the manner of spectacles, said system being responsive to a source of video signals and associated deflection signals and to a spatially coherent input light source for establishing a virtual optical image representing said video signals which is visible only to the observer, comprising:

flying spot scanning means responsive to said deflection signals for forming an unmodulated flying spot raster; and a Bragg light-sound interaction cell constituting said component to be worn, said cell being responsive to said video signals and receiving light from the flying spot raster for modulating the received light to develop a virtual image representing said video signals which is visible only to the observer.

3,860,753
IMAGE RECEIVING AND IMAGE TRANSMITTING FIBER OPTICS CATHODE RAY TUBE FOR FACSIMILE TRANSCEIVER

Asahide Tsuneta, Kawasaki, and Norio Harao, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Continuation of Ser. No. 147,807, May 28, 1971, abandoned. This application Dec. 20, 1973, Ser. No. 426,563
Claims priority, application Japan, May 30, 1970, 45-52671; May 30, 1970, 45-52672
Int. Cl. H01j *25/85, 31/12*
U.S. Cl. 178—7.85 7 Claims

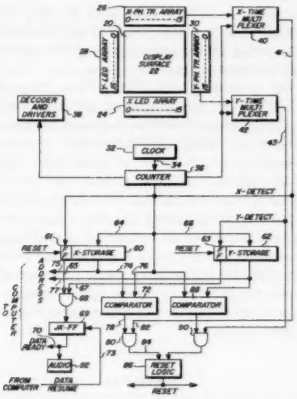


1. An image receiving and image transmitting fiber optics cathode ray tube for a facsimile transreceiver comprising:
- a funnel-shaped tube including a cone portion and neck portion extending therefrom;
- a face plate sealed at an end of said cone portion of said tube, said face plate having a layer of fluorescent material on the inner surface thereof;
- image receiving means including a slender elongated image receiving glass fiber plate which forms a portion of said face plate and which is adapted to be scanned in only one direction and to be contacted with a photosensitive sheet passing thereover, said glass fiber plate being comprised of a number of glass fibers densely arranged in the axial direction of the cathode ray tube;
- image transmission means including a slender elongated image transmission clear glass plate which forms a portion of said face plate and which is adapted to be scanned in only one direction, and an optical system facing said clear glass plate for focussing on an original sheet a light spot from said fluorescent layer which is on the inner surface of said clear glass plate, said glass fiber plate and said clear glass plate being juxtaposed with an outer surface of said glass fiber plate lying in a plane more remote from said end of said cone portion than an outer surface of said clear glass plate so that when said photosensitive sheet is passed over said face plate, said clear glass plate is protected from direct contact therewith;
- a supporting glass plate forming a portion of said face plate and being juxtaposed to said glass fiber plate, said glass fiber plate being interposed between said clear glass plate and said supporting glass plate;
- said fluorescent layer being at least coextensive with said image receiving glass fiber plate and said image transmission clear glass plate; and
- said image receiving means and image transmission means further including an electron gun unit disposed within said neck portion, opposed to said fluorescent layer, and emitting an electron beam to selectively scan the glass fiber plate during image receiving and the clear glass plate during image transmission.

3,860,754
LIGHT BEAM POSITION ENCODER APPARATUS

Roger L. Johnson, Monticello, Ill.; Frederick A. Ebeling, Dearborn, Mich., and James H. Parry, Champaign, Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Filed May 7, 1973, Ser. No. 358,020
Int. Cl. G08c *21/00*
U.S. Cl. 178—18 9 Claims

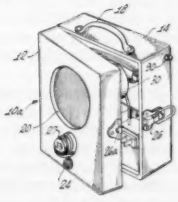


1. In a communication system including a display device, a crossed light beam position encoder for said display device having means for detecting and transmitting the address of interrupted light beams, the improvement comprising:
- a plurality of respectively paired light beam sources and detectors;
- means for sequentially activating said respective pairs of sources and detectors to scan said display device with respective crossed light beams between said sequentially activated paired sources and detectors;
- means for electrically detecting the subsequent status of an initially detected interrupted beam at an associated address; and
- means for inhibiting subsequent transfer of the address of said initially detected interrupted beam in the event the subsequent status at said address has not changed.

3,860,755
NOVEL PORTABLE AMPLIFIER AND SPEAKER

Wayne L. Kimbell, 4319 Melrose Ave., Los Angeles, Calif. 90029, and Richard P. Edlund, 2248 N. Alvarado St., Los Angeles, Calif. 90039

Continuation-in-part of Ser. No. 233,134, March 9, 1972, abandoned. This application Sept. 4, 1973, Ser. No. 394,360
Int. Cl. H04r *1/28*
U.S. Cl. 179—1 E 5 Claims



1. A portable amplified-speaker for musical instruments and the like comprising:

a housing means consisting of two sections only, each of said two sections having lowermost surface means adapted to rest on ground surface;

an amplifier mounted in one of the sections of said housing means;

a speaker mounted in one of said sections of said housing means with the rear of said speaker facing said other section;

a volume switch mounted on the external surface of said housing means;

a jack opening is provided on said housing means, as an electrical input point for musical instruments;

electrical wiring interconnecting amplifier, speaker, switch and jack opening;

means for providing electrical power to said amplifier mounted in one of said housing sections; and

means for pivotally interconnecting said two sections of said housing means along an adjacent pair of vertical edges of said housing means so as to allow said sections to be angularly spread on said ground surface any variable distance of from 0° to about 180°, to thereby allow for an adjustable spacing during operation between the rear of the speakers and the other section of said housing means, said speaker, amplifier and power source being so placed within said housing means so that upon spreading of said sections of said housing means approximately 180°, all of said speaker, amplifier and power source are exposed for complete access.

3,860,756

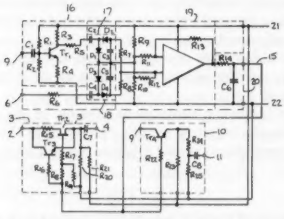
AUTOMATIC VOICE-PATH SWITCHING CIRCUIT FOR A SPEAKER PHONE TELEPHONE SET

Tsuyoshi Shinoi, and Toyoshige Murakami, both of Kawasaki, Japan, assignors to Nippon Tsu Shin Kogyo K.K., Kawasaki-shi, Japan and TIE/Communications Inc., Stamford, Conn.

Filed Mar. 23, 1973, Ser. No. 344,218

Int. Cl. H04m *9/08*

U.S. Cl. 179—1 HF **4 Claims**



1. An electrical switching circuit comprising, in combination,

input terminal means (**2**);

output terminal means (**4**);

at least two parallel electrical signal transmission paths between said input and output terminal means, said first path comprising a resistor (**R15**) and a normally conducting depletion type N channel field effect transistor (**TR2**) serially connected thereto, and said second path comprising a normally non-conducting bipolar NPN transistor (**TR3**);

means (**R20, R21**) for supplying a bias voltage to the drain of said field effect transistor and to the emitter of said NPN transistor, thereby simultaneously to establish said conducting and non-conducting states; and

means for electrically supplying a gating signal to said transistors, which switches said NPN transistor to its conducting state when the magnitude of the gating signal exceeds said bias voltage, and which switches said field effect transistor into its non-conducting state when the magnitude of the gating signal is less than the bias voltage.

3,860,757

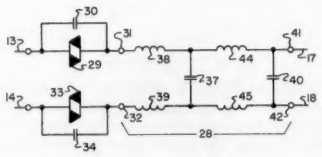
LOWPASS CIRCUIT FOR PHYSICAL PARTY LINE APPLICATIONS IN SUBSCRIBER CARRIER TELEPHONE SYSTEM

James A. Stewart, Menlo Park, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed June 25, 1973, Ser. No. 373,060

Int. Cl. H04h *1/08*

U.S. Cl. 179—2.5 A **10 Claims**



1. A lowpass circuit comprising

a first port of the circuit;

a second port of the circuit;

a lowpass filter comprising first and second filter ports and at least two filter sections that are connected in series; each of said filter sections including a first inductor and first capacitor; said inductor of one filter section being connected in series with one terminal of said first filter port; first means connecting said first capacitors of said two filter section across said first filter port through at least said first inductor of said one filter section; second means connecting the other filter section to said second filter port; said filter exhibiting one series resonance across said first filter port at a frequency in the filter passband when said second filter port is terminated by a load having an impedance that is substantially greater than the characteristic impedance at said second filter port;

a nonpolarized semiconductor device that conducts when a voltage across it exceeds a first prescribed value;

third means electrically connecting said semiconductor device in series between the one terminals of said first circuit and first filter ports;

fourth means electrically connecting the other terminals of said first circuit and first filter ports;

fifth means electrically connecting terminals of said second filter port to respective terminals of said second circuit port;

and

a second capacitor connected in parallel with said device, said second capacitor having a capacitance for cooperating with the reactive elements of said filter for translating th in-band series resonant frequency of said filter to occur at a frequency outside the filter passband;

said semiconductor device being essentially nonconducting when the current through said device is less than a second prescribed value; said device conducting for electrically connecting said filter to said first circuit port when the current through sald device is greater than the second prescribed value.

3,860,758

A TDM SWITCH WITH PLURAL SINGLE-CHARACTER BUFFERS ASSOCIATED WITH EACH OUTPUT LINE

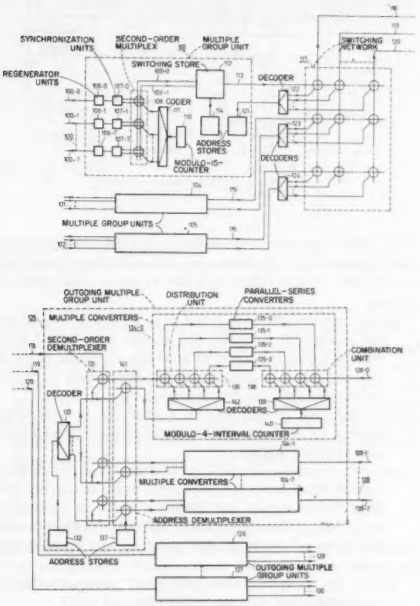
Robert Bertold Buchner, Helversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 124,792, March 16, 1971, abandoned. This application Sept. 28, 1973, Ser. No. 401,660

Claims priority, application Netherlands, Mar. 25, 1970, 7004339

Int. Cl. H04j *3/00*

U.S. Cl. 179—15 AQ **2 Claims**



1. A telecommunication system with time division multiplex, comprising a source of multiplex telecommunication signals, which comprises a multiple group of single connection channels for the transmission of information characters; a plurality of outgoing transmission lines, each of said transmission lines comprising a group of single transmission channels for the transmission of information characters; a separate transmission line unit connected to each transmission line; a clock for generating a time scale which is divided into mutually equal frame time intervals, each interval of which is divided into mutually equal main time intervals, each of which is further divided into mutually equal sub-time intervals, a switching unit connected to said transmission line units and said source of telecommunication signals and having connected thereto a control unit containing variable control information for selectively switching the telecommunication signals from the source of telecommunication signals to each selected transmission line unit in the sub-time intervals of selected connection channels on a separate output line; each transmission line unit containing at least three single character buffer means for receiving information characters in sub-time intervals from the output line of the switching unit connected thereto and for transmitting the received information characters to the single corresponding transmission line in main time intervals, each transmission line unit being connected to a control unit containing variable control information for supplying control information to the transmission line unit in the sub-time intervals of said selected connection channels associated with the source of telecommunication signals; each transmission line unit further comprising a distribution unit connected to said buffers and to the output line of the switching unit connected thereto for distributing information characters from the switching unit over the single character buffers in dependence upon the control information, and a combination unit for connecting the single character buffers in a cyclic sequence to the associated single transmission line in main time intervals of the clock.

3,860,759

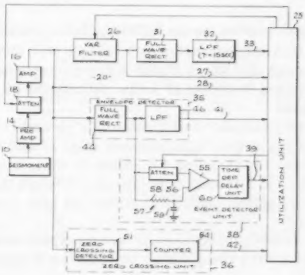
SEISMIC SYSTEM WITH DATA COMPRESSION

Wayne F. Miller, Arcadia, and Francis E. Lehner, Monrovia, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation of Ser. No. 74,642, Sept. 23, 1970, abandoned. This application Apr. 10, 1972, Ser. No. 242,753

Int. Cl. H04b *15/00*

U.S. Cl. 179—15.55 R **18 Claims**



1. In a seismic date compression system of the type to which a variable frequency and amplitude seismic signal is supplied as an input signal, the arrangement comprising:

envelope detecting means responsive to said input signal for providing a variable amplitude direct-current output signal representing the envelope of said input signal, said envelope detecting means including means for rectifying said input signal;

signal crossing detecting means responsive to said input signal for providing an output signal indicative of the number of crossings of said input signal with respect to a reference potential;

event detecting means responsive to said rectified input signal for providing an event-indicating signal of a duration which is not less than a duration during which the amplitude of said rectified input signal exceeds by a preselected ratio the average amplitude of said rectified input signal over a preceding selected period; and

means for sampling the output signals of said envelope detecting means and said signal crossing detecting means during the duration of said event-indicating signals.

3,860,760

ELECTRONIC TIME COMPRESSOR OR EXPANDER

Otto E. Rittenbach, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 6, 1973, Ser. No. 367,618

Int. Cl. H04b *1/66*

U.S. Cl. 179—15.55 T **22 Claims**

1. An electronic time compressor and expander for translating an input signal from a first frequency band to a second frequency band comprising:

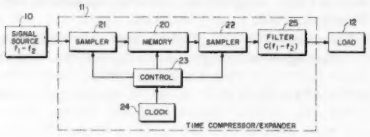
a source of said input signals from said first frequency band;

clock means for generating clock signals at a clock rate;

a control means connected to the output of said clock means for generating a plurality of control signals at predetermined rates;

a first sampler means connected to said source of input signals and said control means for sampling said input signal at a first sampling rate as determined by said control means;

shift register means, having a predetermined number of stages, with the input of at least one stage connected to the output of said first sampler means, for storing a predetermined plurality of said samples obtained by said first sampler means;



said shift register means further including means connected to said control means for shifting said stored samples through said stages of said shift register means in a predetermined sequence at a rate determined by said control means;

a second sampler means connected to said control means and the output of at least one stage of said shift register means for sampling the contents of said shift register means at a second sampling rate different than said first sampling rate under the control of said control means; and

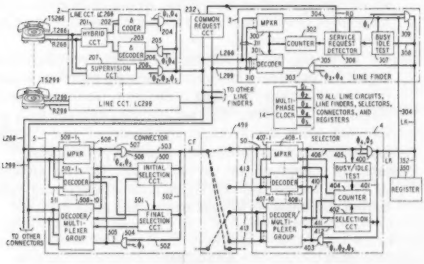
filter means connected to the output of said second sampler means for passing signals in said second frequency band.

3,860,761

DIGITAL PROGRESSIVELY CONTROLLED SWITCHING SYSTEM

John Francis O'Neill, Jr., Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 14, 1973, Ser. No. 369,902
Int. Cl. H04j *3/12*; **H04q** *11/04*
U.S. Cl. 179—18 J **26 Claims**



1. A switching stage for a multi-stage communications exchange, said stage comprising a common terminal at one side and a plurality of selectable terminals at its other side,

a first digital transmission path operable during a first time phase,

a second digital transmission path operable during a second time phase, and

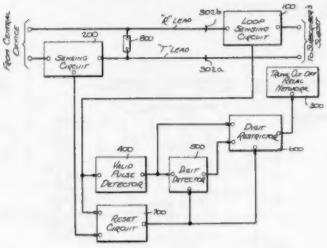
means operable during further time phases for connecting said first and said second path between said common terminal and a predetermined one of said plurality of selectable terminals.

3,860,762

TOLL RESTRICTION CIRCUIT

Gerhart F. Klaiber, Deal; Ove Villadsen, Spring Lake Heights, both of N.J., and Charles Schwartz, Philadelphia, Pa., assignors to TIE/Communications, Inc., Stamford, Conn.

Filed Dec. 6, 1972, Ser. No. 312,768
Int. Cl. H04m *1/66*
U.S. Cl. 179—18 DA **27 Claims**



1. A toll restriction circuit for preventing the placement of unauthorized toll calls from a preselected subset connected to a telephone central office by a pair of wires, said circuit comprising:

means, electrically connected to at least one of said wires, for electrically coupling the signals transmitted on said pair of wires, including at least the electrical pulse train representative of digits dialed at said subset to the next-mentioned optoelectronic device means;

optoelectronic device means, responsive to said coupled signals, for deriving a light output signal representative of said coupled signals;

means, responsive to said light output signal, for generating an electrical pulse for each light pulse occurring in said light output signal, and having a width in a preselected range of widths, said preselected range corresponding to the range of widths of dial pulses in said electrical pulse train;

means for coupling said generated pulses to the next-mentioned first and second means;

first means and second means responsive to said generated pulses, said first means for generating and supplying an electrical signal to said second means, said electrical signal being representative of the ordinal position of digits dialed at said subset, and said second means, being constructed and arranged to combine the inputs thereto, for determining whether digits dialed at said subset constitute a dialing code to be restricted, and for generating an output signal representative of said determination;

the combination being so constructed and arranged that an output signal, representative of the determination that a dialing code to be restricted has been dialed, is generated when the first digit dialed is 0, or when the second digit dialed is 0 or 1.

3,860,763

AUTOMATIC EXCLUSION CIRCUIT FOR A KEY TELEPHONE SET

Kengo Sudoh, and Mikihiro Ichikawa, both of Kawasaki, Japan, assignors to Nippon Tsu Shin Kogyo K.K., Kawasaki-shi, Japan and TIE/Communications Inc., Stamford, Conn.

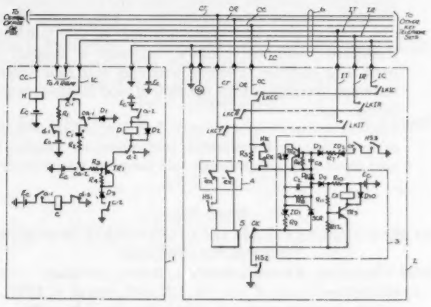
Filed Apr. 5, 1973, Ser. No. 348,313
Claims priority, application Japan, Jan. 13, 1973, 48/12510
Int. Cl. H04m *1/70*
U.S. Cl. 179—18 DA **10 Claims**

1. An automatic key telephone set exclusion circuit for use in a key telephone system having a plurality of key telephone sets wherein each key telephone set includes a telephone speech network circuit and at least one intercom line circuit

means interconnecting said telephone sets, said exclusion circuit comprising

an exclusion relay circuit means in each telephone set for controlling the connection of the key telephone speech network circuit to the intercom line circuit means;

indicating circuit means for producing an output signal indicating the condition of the line circuit means when connected to the line circuit means, said means producing a first output signal indicating when the line circuit



means is idle and a second output signal indicating when the line circuit means is in use by at least one set; and

means in each key telephone set, responsive to the first and second output signals of said indicating means, for connecting the telephone network circuit to the line circuit means in response to said first output signal and operating said exclusion relay means to block the connection of the telephone network circuit from the line circuit means in response to said second output signal.

3,860,764

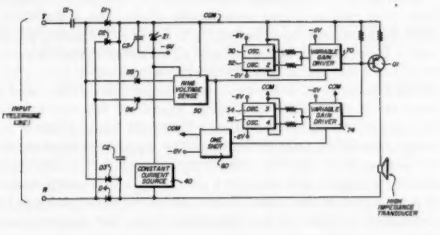
ELECTRONIC TONE GENERATOR

Kenneth Watt Martin, and John Moniak, both of Corinth, Miss., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 12, 1973, Ser. No. 322,929

Int. Cl. H04m *3/02*

U.S. Cl. 179—84 T **8 Claims**



8. An electronic tone generator for simulating the sound of a mechanical chime in response to a telephone ringing signal, said generator comprising, in combination: a plurality of oscillators, each oscillator providing a substantially constant output signal having a frequency different from the frequency of the other oscillators; first means for summing the output signals of a first pair of said oscillators, second means for summing the output signals of a second pair of said oscillators, first amplifying means operative after receipt of said ringing signal to emit an amplified signal based on said summed output of said first pair of oscillators during a first given time period wherein the amplitude of said summed signal emitted by said amplifying means decays from an amplified level to an attenuated level during said first given time period, second amplifying means operatively responsive to the end of said ringing signal to emit an amplified signal based on the summed output of said second pair of oscillators during a second given time period wherein the amplitude of said summed signal emitted by said second amplifying means decays from a first level to a second level during said second given time period, and wherein said first and second given time periods overlap for a further time period, and an output transducer receptive of the output signals from said amplifying means to produce a two-tone chime-like audio output.

3,860,765

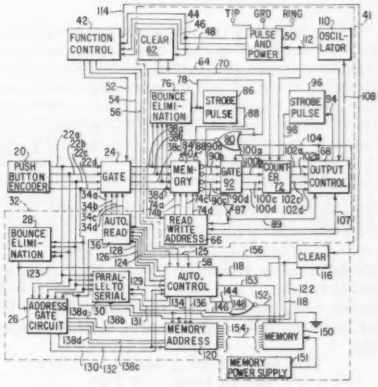
TELEPHONE NUMBER GENERATOR

Edward J. McCabe, and Donald E. Westphal, both of Wellsboro, Pa., assignors to Mek-Tronix Laboratories Corporation, Mansfield, Pa.

Filed Nov. 16, 1973, Ser. No. 416,660

Int. Cl. H04m *1/51*

U.S. Cl. 179—90 B **10 Claims**



1. An apparatus for generating signals corresponding to digits of a selected telephone number on a telephone line comprising

a single push-button keyboard including 10 push-button switches,

switch means for selecting a record mode or a call mode,

memory means for receiving and storing representations of a plurality of telephone numbers in selected locations of the memory means, each of the plurality of telephone numbers having a plurality of digits,

means responsive to a first operation of the push-button switches when the switch means is in the record mode or the call mode for selecting a location in the memory means,

means responsive to subsequent operation of the push-button switches in accordance with the selected telephone number when the switch means is in the record mode for storing representations of the selected telephone number in the selected location in the memory means,

means responsive to the receipt of a representation of a digit for producing signals on the telephone line corresponding to the received representation of the digit, and

means responsive to the memory location selecting means when the switch means is in the call mode for applying the representation of digits from the selected location to the signal producing means.

3,860,766

OPTICAL SIGNAL REPRODUCING APPARATUS

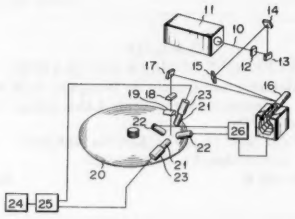
Masafumi Mori, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed May 31, 1973, Ser. No. 365,752

Claims priority, application Japan, May 31, 1972, 47-53324; June 12, 1972, 47-57691; July 20, 1972, 47-71998; July 20, 1972, 47-71999

Int. Cl. G11b *7/00;* **H04n** *5/76;* **G11b** *3/00*

U.S. Cl. 179—100.4 R **11 Claims**



1. Optical signal reproducing apparatus comprising a recording medium including a groove storing a signal as continuous sine curve shaped irregularities having a pitch of the order of microns, a source of light for emanating a light beam of a definite phase, means for projecting said beam upon the groove of said recording medium after limiting the width of said beam to an extent smaller than or equal to the minimum pitch of said irregularities, and means for detecting the diffracted light reflected by said irregularities.

3,860,767

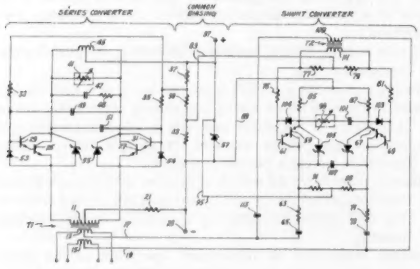
VOICE FREQUENCY REPEATER

C. Wendell Boucher, Huntington Beach, and Thomas W. Hanneman, Fountain Valley, both of Calif., assignors to Jim C. Garrett, Long Beach; Robert H. Johnson, Marina Del Rey and Jack Shelton, Long Beach, all of, Calif., part interest to each

Filed Sept. 26, 1972, Ser. No. 292,303

Int. Cl. H04b *3/18, 3/40*

U.S. Cl. 179—170 G **16 Claims**



1. A negative impedance repeater comprising:

a. a connecting transformer;

b. a separate, distinct series converter and a separate, distinct shunt converter each connected to said connecting transformer;

c. said converters each having a plurality of amplifying semiconductor means; and

d. a biasing circuit for said semiconductor means, a portion of said biasing circuit being common to the semiconductor means in both of said converters.

13. A line build-out network comprising:

a. a pair of input terminals;

b. a low-frequency corrector connected across said input terminals;

c. a coupling transformer including a separate primary winding connected to each one of said input terminals;

d. a build-out transformer including a plurality of windings;

e. a variable build-out capacitance and a variable build-out resistance wherein said variable capacitance is connected to said separate primary windings through first and second windings of said build-out transformer, said variable capacitance is connected to said output terminals through third and fourth windings of said build-out transformer and said variable resistance is coupled to both said separate primary windings and said output terminals through a fifth winding of said buildout transformer; ,and,

f. a high frequency corrector including a secondary winding of said coupling transformer, said corrector coupled to said input terminals through said coupling transformer.

3,860,768

ECHO COMPENSATION CIRCUIT TO ERASE ECHOES IN TELEPHONE CIRCUITS

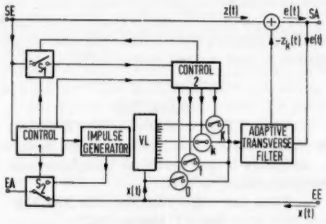
Rolf Wehrmann, Rheinbabenallee 1, Berlin, Germany

Continuation-in-part of Ser. No. 122,448, March 9, 1971,. This application Mar. 5, 1973, Ser. No. 338,169

Claims priority, application Germany, Mar. 12, 1970, 2011669

Int. Cl. H04m *9/08*

U.S. Cl. 179—170.2 **1 Claim**



1. In an echo compensation circuit for telephone connections over two wire-four wire cicuits of the type wherein the echo is eliminated by superposing a signal of opposing phase which is derived from the speech signal creating the echo by means of a transverse filter, wherein the transverse filter comprises a number of delay circuits having a delay time τ and a number of adjustable coefficient members for the tapped voltages of the transverse filter, adjustment being effected by cross-correlation analysis between the tapped voltages of the transverse filter and the remaining echo at the transmission direction output, and wherein a delay line which compensates at least a part of the basic transit time of the echo path can be connected in front of the transverse filter, the improvement therein comprising the provision of said delay line as a number of delay members which in each case have the same delay time τ as the delay members of the transverse filter, a pulse generator providing a test pulse to the echo path between the output in the receiving direction and the input in the transmitting direction and providing cyclically recurring pulses at intervals τ, timing means connected to the input in the transmitting direction for measuring the time for pulse reply to exceed a predetermined threshold in response to the cyclically recurring pulses, and means connected between said time measuring means and said number of delay line members for connecting a number k of said delay members in front of said transverse filter to simulate the measured transit time, including a first plurality of switches operable in accordance with the

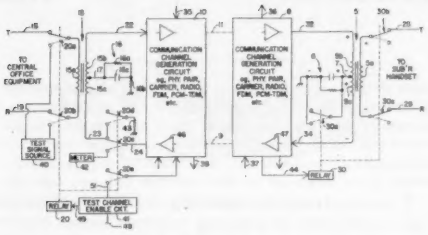
echo path transit time by connecting said delay members in circuit ahead of said transverse filter, and a control unit including a second plurality of switchs cooperable with said first plurality of switches to effect said delay member connections, said pulse generator and said timing means and said first plurality of switches and said control unit and its second plurality of switches jointly connectible for serving a number of echo compensation circuits.

3,860,769

METHOD AND APPARATUS FOR TESTING THE OPERATION OF A COMMUNICATION SYSTEM

Alvin L. Pachynski, Jr., Redwood City, Calif., assignor to GTE Lenkurt Incorporated, San Carlos, Calif.

Filed Nov. 1, 1972, Ser. No. 302,975
Int. Cl. H04b *3/46*
U.S. Cl. 179—175.3 R **20 Claims**


TO CENTRAL OFFICE EQUIPMENT
COMMUNICATION CHANNEL GENERATION CIRCUIT eg. PHY. PAIR, CARRIER, RADIO, FDM, PCM-TDM, etc.
COMMUNICATION CHANNEL GENERATION CIRCUIT eg. PHY. PAIR, CARRIER, RADIO, FDM, PCM-TDM, etc.
TO SUB'R HANDSET
TEST SIGNAL SOURCE
METER
RELAY
TEST CHANNEL ENABLE CKT

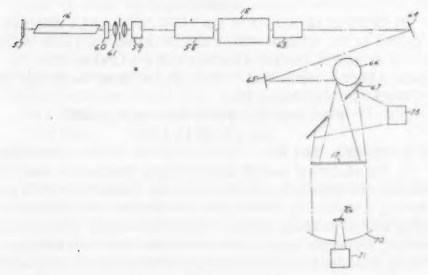
1. In a method of testing the quality of transmission on a pair of unidirectional communication channels forming bidirectional transmission paths through a hybrid having a pair of ports connected to the pair of ends of associated channels, the improvement comprising the step of selectively varying the return loss of the hybrid to unbalance that hybrid for coupling an applied signal on one channel through the hybrid and onto the other channel for subsequent measurement.

3,860,770

SYSTEM FOR STORING TONE PATTERNS FOR AUDIBLE RETRIEVAL

Bernard David Nadler, Bayside, and Mitchell A. Cotter, Riverdale, both of N.Y., assignors to APM Corporation, Englewood, N.J.

Division of Ser. No. 295,234, Oct. 5, 1972, Pat. No. 3,810,106. This application Oct. 29, 1973, Ser. No. 410,430
Int. Cl. G11b *7/00*
U.S. Cl. 179—100.3 B **2 Claims**



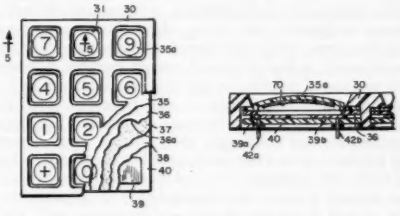
1. Data storage and retrieval means comprising: a generally rectangularly shaped, at least partially transparent record, a plurality of opaque elongated tracks disposed in juxtaposed parallel relation upon one surface of said plate, and defining open areas therebetween, a laser scanner and laser scanner drive means causing said laser scanner to perform a scan orthogonally of the principal axes of said track means to produce a sampling of said record means for selecting a desired subset of the total sample set, first light sensor means receiving light from said laser reflected by opaque portions of said tracks, and second light sensor means receiving light transmitted through said open areas thereof, signal processing means for converting reflected light to a signal of first polarity, and transmitted light to a signal of opposite polarity, and means summing said signals in terms of algebraic value.

3,860,771

KEYBOARD SWITCH ASSEMBLY WITH DOME SHAPED ACTUATOR HAVING ASSOCIATED UNDERLYING CONTACTOR MEANS

William J. Lynn, Groveland, and Richard E. Seeger, Topsfield, both of Mass., assignors to Chomerics, Inc., Woburn, Mass.

Filed Oct. 29, 1973, Ser. No. 410,329
Int. Cl. H01h *13/70, 1/02*
U.S. Cl. 200—5 A **46 Claims**



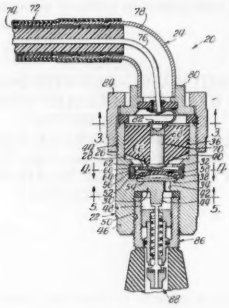
1. A keyboard assembly comprising first means for supporting an electrically conductive contact means, electrically conductive contactor means positioned over but out of electrical contact with said contact means, support means for positioning said conductive contact or means over but out of electrical contact with said contact means a flexible and resilient plastic sheet means positioned above said conductive contactor means and having formed therein a plurality of raised protrusions positioned at the center thereof farthest from said conductive contact means, said protrusions each comprising a pedestal and a curved surface capping said pedestal, said curved surface being depressable at its center under pressure below the pedestal to push said conductive contactor means against said contact means and snapping through the center upon depression sufficient to cause electrical contact between said conductive contactor means and said contact means, and said curved surface recovering back through the center after pressure is withdrawn therefrom and a snap through layer positioned between said sheet means and said conductive contact or means, said snap through layer having a plurality of openings therethrough in register with said protrusions, said protrusions extending into said openings upon depression through center sufficient to cause contact between said contactor means and contact means.

3,860,772

AIR PRESSURE RESPONSIVE SWITCH FOR VEHICLE TIRE AND THE LIKE WITH HINGED CONTACT AND DIAPHRAGM

Lucid Lincoln Byrd, Evanston, Ill., assignor to Carter Precision Electric Company, Skokie, Ill.

Filed Apr. 30, 1973, Ser. No. 355,573
Int. Cl. H01h *35/34*
U.S. Cl. 200—83 N **15 Claims**



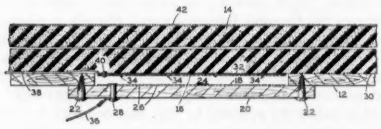
1. An air pressure responsive switch having a switch body with an axial opening in one end thereof and a transverse wall at the inner end of said opening, a transverse resilient diaphragm mounted in said opening adjacent said transverse wall, said transverse wall being formed with axial aperture means therethrough, a first electrical contact member mounted in said opening coaxially thereof and spaced from said diaphragm in opposed relation to said transverse wall, and a second electrical contact member mounted in said opening intermediate said diaphragm and said first contact member and having at least a portion thereof being engaged and movable with said diaphragm into and out of engagement with said first contact member in response to the air pressure on the side of said diaphragm facing said transverse wall, the improvement wherein said second contact member is a transversely disposed disc comprising an annular ring portion and a central circular contact portion interconnected by an integral narrow radial hinge portion.

3,860,773

COMPOSITE SEAT AND SWITCH WITH RECESSED CONTACTING SHEET

John G. Fontaine, Fort Lauderdale, Fla., assignor to Safe Stop Brake Corporation, Fort Lauderdale, Fla.

Filed Mar. 4, 1974, Ser. No. 447,515
Int. Cl. H01h *13/16*
U.S. Cl. 200—85 A **8 Claims**



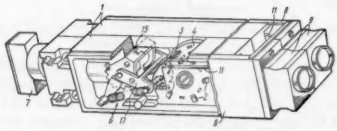
1. In a composite seat and switch including a base, a resilient pad covering said base, a pair of contacting sheets mounted between said pad and said base and having contacts spread over the area thereof adapted to close when a person sits on the seat and switch, and a seat cover covering said pad, base and contacting sheets, the improvement wherein said base constitutes a relatively rigid panel, said contacting sheets are affixed respectively to said pad and said panel in opposed, spaced and parallel relation with each other, one of said panel and said pad has a recessed surface receiving one of said contacting sheets, and said one contacting sheet is affixed to said recessed surface so as to be separated only by air from the other contacting sheet, whereby said base, pad, sheets and seat cover are integrated into a composite seat and switch in whch said contacts close when a person sits on said seat cover and opens when the person leaves the same as a result of the resilient action of said pad.

3,860,774

ROTARY-TYPE CONTROL SWITCH FOR SELECTIVELY CONTROLLING A PLURALITY OF ELECTRICAL CIRCUITS

Mikhail Iosifovich Karger, ulitsa Mikhailovgradskaya 79, kv. 78; Leonid Vasilievich Tolochko, ulitsa Dovzhenko, 62, kv. 47, and Petr Vladimirovich Yaroschuk, ulitsa Tsiolkovskogo, 6, kv. 48, all of Zhitomir, U.S.S.R.

Filed Aug. 23, 1973, Ser. No. 390,945
Int. Cl. H01h *19/10*
U.S. Cl. 200—155 R **4 Claims**



1. A control switch for controlling electric circuits comprising a combination of a housing; stationary contact elements secured to the opposite walls of the housing and arranged in concentric circles along a longitudinal axis of the switch to form pairs of stationary contacts inside said housing; at least one carrier disk having a lug on the side thereof and a toothed rim on the side opposite said lug, said toothed rim being adapted to mesh said disk with another disk; movable contact elements secured on said disk in such a manner that the contact parts of said contact elements are disposed on both surfaces of said carrier disk along respective concentric circles; said carrier disk disposed in such a manner that its axis of rotation passes transversely to the longitudinal axis of the switch and simultaneously passes through the centre of said concentric circles so that said movable contact elements bridge the distance between each pair of stationary contact elements when said disk is turned, and a switching mechanism, determining the angular positions of said disk, which mechanism includes a toothed bushing, the toothed end of said bushing meshing with the toothed sector of a crank lever having one axis or rotation with an H-shaped carrier, said lug operatively connecting said H-shaped carrier and said carrier disk having said lug thereon.

3,860,775

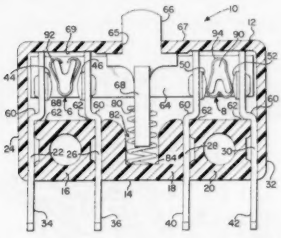
ELECTRICAL SWITCH HAVING MOVABLE SPRING CONTACTS WHICH PROVIDE WIPING ACTION WITH ASSOCIATED STATIONARY CONTACTS

John Albert Koepke, Des Plaines, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Nov. 16, 1973, Ser. No. 416,489
Int. Cl. H01h *1/36*
U.S. Cl. 200—164 R **4 Claims**

1. An electrical switch comprising a housing, a switching station comprising a pair of electrically conductive leads each having a stationary contact means thereon, an actuator movable in said housing between first and second positions and having a contact support member associated with said pair of leads, resilient means for biasing said actuator towards its first position and a movable electrical contact means supported by said support member, said movable contact means having first and second resilient contact sections that are joined by a connecting section, and said first and said second contact sections having segments which are spaced from an adjacent

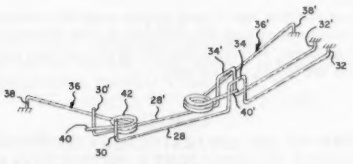
portion of their respective support member when the electrical circuit between said pair of leads is open and which are deflected towards said adjacent portion of said support member by said stationary contact means when said electrical circuit is closed so as to provide a wiping action between said movable and said stationary contact means said movable contact means further having a generally U-shaped connection section and a pair of generally J-shaped sections which face each other and which diverge outwardly from said U-shaped section at an acute angle, and said support member being constructed to receive said U-shaped connecting section and having a pair of bifurcated arms which are in engagement with said J-shaped sections only at the outer areas thereof when said electrical circuit is open.



3,860,776
MOMENTARY SWITCH WITH WIRE SPRING COMPONENTS

Joseph Larue Lockard, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed July 19, 1973, Ser. No. 380,934
Int. Cl. H01h *1/06*
U.S. Cl. 200—276 **2 Claims**

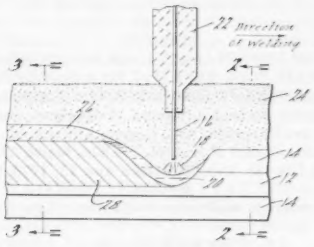


1. A switch, comprising:
a dielectric base having a pair of pockets,
a pair of wires having first ends thereof embedded in said base,
first and second recesses in said base,
second ends of said wires being mounted in mutual spaced relationship within the first recess of said base,
medial portions of said wires having bight portions mounted in mutual spaced relationship within the second recess of said base,
first and second springs having coiled central portions received in the respective pockets,
a first end of each spring protruding from a corresponding pocket and embedded in said base,
a second end of said first spring being received between said second ends of said wires and being capable of resilient deflection into electrical engagement with each of said second ends of said wires,
a second end of said second spring being received between said bight portions and being capable of resilient deflection into electrical engagement with each of said bight portions, and
actuator means received by said base for engaging and resiliently deflecting a corresponding second end of a corresponding spring.

3,860,777
PROCESS FOR WELDING LOW-ALLOY STEELS CONTAINING NIOBIUM

James M. Sawhill, Jr., Ann Arbor, Mich., assignor to American Metal Climax, Inc., New York, N.Y.

Filed Apr. 3, 1974, Ser. No. 457,468
Int. Cl. B23k *31/06*
U.S. Cl. 219—61 **25 Claims**



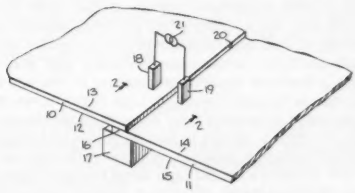
1. The process for welding a low-alloy steel base plate metal containing greater than about 0.02% niobium to produce a welded connection of improved strength and toughness which comprises the steps of heating the base metal in the area defining the joint to be welded to cause at least a partial melting thereof and the formation of a liquid weld metal, introducing into said liquid weld metal in a manner to effect an alloying thereof an additive metal selected from the group consisting of titanium, vanadium and mixtures thereof, said additive metal present in an amount to provide a residual concentration in the resultant solidified weld deposit produced in proportion to the amount of niobium present in said weld deposit in accordance with the following relationship:

$$2.5 \times \%Ti + 0.4 \times \%V = (0.5 \text{ to } 2.0) \times \%Nb.$$

3,860,778
MELT WELDING BY HIGH FREQUENCY ELECTRICAL CURRENT

Wallace C. Rudd, Larchmont, N.Y., and Humfrey N. Udall, Darien, Conn., assignors to Thermatool Corp., Stamford, Conn.

Filed Mar. 8, 1974, Ser. No. 449,371
Int. Cl. B23k *11/08*
U.S. Cl. 219—67 **27 Claims**



1. The method of melt welding together a plurality of metal parts, at least one of said parts having at least a portion of its surface in contact with at least a portion of the surface of another of said parts to provide contacting surface portions between said one part and said other part and the weld being at and adjacent said contacting surface portions, said method comprising causing a high frequency electric current to flow in the parts in a direction which extends from a first area on

a surface of said one part which is spaced from said contacting surface portions to a second area spaced from said first area and on a surface of one of said parts other than the contacting surface portion thereof, said current having a frequency such that the effective resistance of the metal between said first and second areas is at least equal to the contact resistance between said contacting surface portions and the time duration and magnitude of said current being sufficient to melt the metal of said one part and at least a portion of the metal of said other part which is intermediate said first and second areas without dislodging all of the molten metal from between said first and second areas, and thereafter, causing said molten metal to cool and solidify.

3,860,779

METHOD AND APPARATUS FOR POSITIONING AN ELECTRODE-TOOL RELATIVE TO A WORKPIECE IN ELECTRICAL DISCHARGE MACHINING

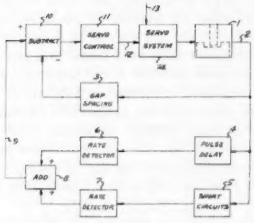
Georges-Andre Marendaz, Geneva, Switzerland, assignor to Ateliers des Charmilles S.A., Geneva, Switzerland

Continuation-in-part of Ser. No. 236,826, March 22, 1972, Pat. No. 3,739,136. This application Apr. 13, 1973, Ser. No. 350,729

Claims priority, application Switzerland, Apr. 21, 1972, 5908/72

Int. Cl. B23p *1/08*

U.S. Cl. 219—69 G **29 Claims**



26. An apparatus for positioning an electrode-tool relative to a workpiece in an electro-erosion machining apparatus wherein interrupted electrical discharges occur across a machining gap between said electrode-tool and said workpiece by way of controlled voltage and current pulses and wherein the machining gap spacing between the electrode-tool and the workpiece is controlled as a function of a command signal of a predetermined magnitude applied to the input of servo system effecting the advance of the electrode-tool relative to the workpiece, said apparatus comprising means for applying electrical discharges across said machining gap, means for obtaining a feedback signal representative of the actual gap spacing, means for providing a first logic signal representative of the presence of random time delay intervals between the moment at which a voltage is applied across said machining gap and the moment at which current passes through said gap, means for providing a second logic signal representative of the presence during passage of current through said gap of a machining voltage which is less than a predetermined level, means for providing a first electrical magnitude representing the average value of said first logic signal, means for providing a second electrical magnitude representing the average value of said second logic signal, and means for obtaining said command signal by combining said first and second electrical magnitudes for obtaining a reference command signal and by combining said reference command signal and said feedback signal.

3,860,780

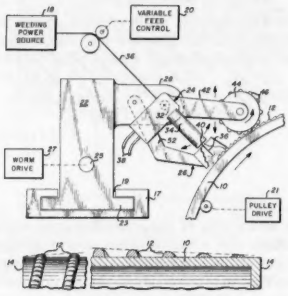
METHOD OF MAKING SELF-CENTERING PULLEY USING MIG WELDING

Rene Conrad, San Meteo, Calif., assignor to Dynaloc Corporation, San Mateo, Calif.

Filed Sept. 24, 1973, Ser. No. 400,426

Int. Cl. B23k *9/04*

U.S. Cl. 219—76 **10 Claims**



8. A method of making self-centering pulleys of the type which include a generally cylindrical body having spirally tending ribbing on the outer surface thereof, comprising the steps of:

rotating said body about its longitudinal axis;

moving a source of quick setting molten material parallel to the longitudinal axis of said body;

continuously depositing a stream of quick setting molten material from said source onto said surface of said body; and

varying the flow rate of said molten material as said source is moved along said path whereby spirally tending ribbing of uniformly varying height above said surface is formed over the length of said body.

3,860,781

METHOD OF AND APPARATUS FOR CONTINUOUSLY PRODUCING WELDED LIGHT CONSTRUCTION BEAM SECTIONS, IN PARTICULAR I- OR T-BEAMS

Hans Aschauer, Eferding, and Karl Steinmair, Schiedlberg, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed June 4, 1973, Ser. No. 366,281

Claims priority, application Austria, June 6, 1972, 4840/72

Int. Cl. B23k *11/06*

U.S. Cl. 219—83 **15 Claims**

1. A method of continuously producing welded light construction beam sections, particularly I and T beams, having a web and at least one flange of equal wall thickness from a strip stock, comprising the steps of

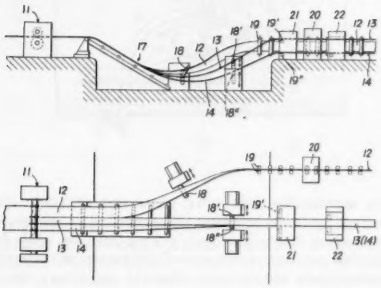
progressively slitting one end of a single length of strip stock to continuously form a web and at least one flange constituting strips,

passing the web and flange constituting strips as they are formed through guiding devices to bring the strips together into the desired cross-sectional form by rotating at least one of the web and flange constituting strips into a plane different from the plane of the other constituting strips without changing the orientation of the as yet unslit portion of the single strip, and

joining the web and flange constituting strips by longitudinal seam welding after the continually formed strips are brought together.

8. An apparatus for continuously producing welded light construction beam sections, particularly I and T beams, having a web and at least one flange of equal wall thickness from a single strip, which comprises

a sheet coil supply and uncoiling means



a sheet slitting means arranged after the sheet coil supply and uncoiling means and adapted to progressively slit the end of the single strip to continuously form web and flange constituting strips,

strip guiding means for orienting and bringing the strips together into the desired cross-sectional form by rotating at least one of the strips into a plane different from the plane of the other strip without changing the orientation of the sheet coil supply, and

welding means for longitudinal seam welding of the web and flange constituting strips after they are brought together.

3,860,782

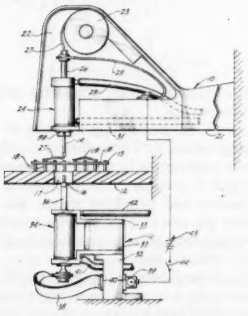
WELDING MACHINE

Bill Lee Hamby, Newhall, Calif., assignor to Sterling Electronics Corporation, Westlake Village, Calif.

Filed Aug. 12, 1971, Ser. No. 171,095

Int. Cl. H01c *5/00*

U.S. Cl. 219—89 **6 Claims**



1. A pneumatic welder for welding a conductor through a cold flowable insulation comprising:

a pair of opposed electrodes;

a pneumatic actuator connected to one of the electrodes for imparting movement thereto towards the other electrode;

manifold means for connection to a source of pressurized gas;

position pressure means connected to the manifold means for supplying the gas to the actuator under a first predetermined sufficient pressure to contact the electrode attached thereto with an insulated conductor to be welded without penetrating the insulation;

breakthrough pressure means connected to the manifold means for supplying the gas to the actuator under a second predetermined sufficient pressure to press the electrode attached thereto through the insulation around the conductor sequentially after the positioning pressure means;

weld cycle pressure means connected to the manifold means for supplying the gas to the actuator under a third predetermined sufficient pressure to maintain a desired welding force sequentially after the breakthrough pressure means; and

release means coupled to the one electrode for moving the electrodes apart.

3,860,783

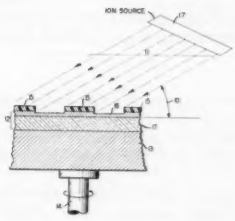
ION ETCHING THROUGH A PATTERN MASK

Paul Herman Schmidt, Chatham, and Edward Guerrant Spencer, Murray Hill, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 19, 1970, Ser. No. 81,756

Int. Cl. B23k *15/00*

U.S. Cl. 219—121 EM **13 Claims**



1. Method for the production of a pattern of voids in a surface of a rigid body comprising:

a. applying to the surface a pattern mask thereby producing a covered portion of the surface and an exposed portion of the surface, and

b. removing material from the exposed portion of the surface by means of a removal agent CHARACTERIZED IN THAT the removal agent consists of a beam of ions which ions are parallel to within ±5° and possess energies greater than 1,000 electron volts, which beam is incident so as to strike both the pattern mask and the exposed portion of the surface.

3,860,784

DEEP PENETRATION WELDING USING LASERS

Clyde O. Brown, Newington, and Conrad M. Banas, Manchester, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Continuation of Ser. No. 122,070, March 8, 1971, abandoned. This application Mar. 14, 1973, Ser. No. 341,009

Int. Cl. B23k *27/00*

U.S. Cl. 219—121 LM **4 Claims**

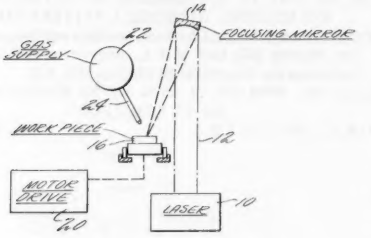
1. The method of forming a continuous weld having a depth substantially greater than its width in a relatively thick workpiece material by means of direct energy transfer into the material to melt the material to the desired weld depth and without relying on heat conduction into the material from the surface thereof which comprises

generating a continuous beam of coherent optical radiation in a fundamental mode by a continuous wave laser,

amplifying said beam of radiation to a power of at least 3 kw in a medium containing CO_2,

focusing the beam of radiation at a point at or in the vicinity of the surface of the workpiece material to be welded so that the power density of the beam on the surface of the workpiece material is in the range between 10^6 and 10^8 watts/in.^{2}, said power density being maintained at a value within said range sufficient to overcome losses caused by surface reflectivity of said workpiece material and to permit localized absorption of said beam by said workpiece material at the point of initial impingement,

maintaining the beam at the point of initial impingement on the workpiece surface for a time, depending on the beam power density and the reflectivity of the workpiece material at the wavelength of said radiation beam, which is sufficient to initiate vaporization of the workpiece material at the point of beam impingement and to create a void in said material to the desired depth of penetration before sufficient energy has been conducted to the surrounding



workpiece material to cause melting thereof, said beam penetrating into the void and melting the laterally adjacent material by direct energy transfer from the beam to the material over the entire depth of the penetrating beam,

and moving the beam relative to the workpiece material so that the beam moves across the surface of the workpiece material a distance of at least ten times the cross-sectional width of the beam at its point of initial impingement on the workpiece prior to the time that a stable hole would be formed in said workpiece material at said point of initial impingement if movement did not occur, said movement causing the void to become dynamically stable and to translate through the workpiece material with a small area of molten material located adjacent the beam, fusion of said molten material occurring directly behind the beam to form a weld whose width is on the order of the beam diameter and whose depth is substantially greater than its width and proportional to the total power incident on said workpiece material as a function of the rate of relative movement.

3,860,785

GROUNDING DEVICE FOR ELECTRIC WELDING

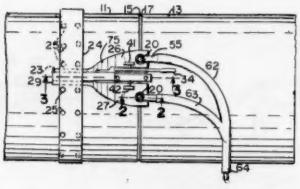
Eric W. Wittman, Houston, Tex., assignor to CRC-Crose International, Inc., Houston, Tex.

Filed Feb. 1, 1974, Ser. No. 438,537

Int. Cl. B23k *9/00;* **H01r** *13/24, 9/06*

U.S. Cl. 219—136 **10 Claims**

1. A grounding device for electric welding apparatus operating on a hollow work piece such as a pipeline or the like comprising, in combination, a work contacting element, means connecting said contact element to a device to be grounded to the work, a resilient holder for said contact element which is adapted when free to spring away and remove the element from grounding contact with said work piece, a relatively fixed and rigid member supporting said resilient holder and having an extension adapted to be held in a fixed position with respect to said work piece, operating means between said rigid member and said resilient holder for selectively locking the resilient holder in a position for making clean low resistance grounding contact with the work piece or allowing the resilient means to break contact and retaining



means surrounding said work piece and annularly spaced therefrom for firmly retaining said extension by friction while the operating means is in said locking position, while freely permitting insertion or removal of said extension between the retaining means and the work when the operating means is in a free break-contact position.

3,860,786

CONTROL MECHANISMS

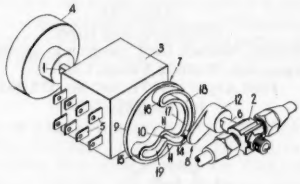
Anthony Charles Lammond Wass, Duddington, England, assignor to British Domestic Appliances Limited, Peterborough, England

Filed Feb. 28, 1973, Ser. No. 336,633

Claims priority, application Great Britain, Mar. 3, 1972, 10030/72

Int. Cl. F27d *11/00*

U.S. Cl. 219—279 **11 Claims**



1. A control mechanism for apparatus energized by gas or electricity comprising:

a. valve means for controlling a supply of gas;

b. switching means for controlling a supply of electricity;

c. a selector common to both the valve means and switching means and having an "off" position in which both the valve means and switching means are prevented from supplying gas and electricity respectively;

d. cam means rotatable by the selector for actuating said switching means; and

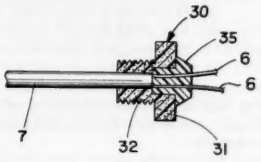
e. coupling means comprising a first part rotatable by the selector, and a second part for actuating said valve means, one of said parts providing a guide path, and the other of said parts carrying a member rideable along said path on actuation of the selector, said path being shaped and arranged to move the valve means between open and closed positions while the switch means controlling the supply of electricity is unactuated, and to leave the valve means closed while the switching means is actuated.

3,860,787

IMMERSION TYPE HEATING ELEMENT WITH A PLASTIC HEAD FOR A STORAGE WATER HEATER TANK

Carl G. Strobach, Clarendon Hills, Ill., assignor to Rheem International, Inc., Chicago, Ill.

Filed Nov. 5, 1973, Ser. No. 412,839
Int. Cl. F24h 1/20
U.S. Cl. 219—336 5 Claims



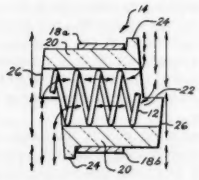
1. In an electric immersion water heater element for a water heater tank which includes a heating element enclosed in and electrically insulated from a metallic sheath, and an element head for attachment to a water heater tank with the heating element adapted to project to the interior of the water heater tank said element head being mechanically and electrically secured to the metallic sheath, the improvement which comprises an element head including a dielectric solid portion in contact with said sheath and to contact said tank, said dielectric portion having suspended therein conductive carbon or metallic particles in an amount sufficient to allow current to flow from said sheath through the dielectric portion to ground on said tank, said head also including a nonconducting portion through which external leads are provided for connecting said heating element to a power source.

3,860,788

OPEN WIRE HEATER ELEMENT SUPPORT

Paul R. Staples, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Feb. 21, 1974, Ser. No. 444,525
Int. Cl. H05b 3/06; H01b 17/58; H01c 1/08
U.S. Cl. 219—532 4 Claims



1. An electric insulator supporting a heater coil adapted to be arranged in a path of air comprising:

a body member formed of heat refractory insulating material having an aperture extending longitudinally through said body member receiving a portion of said coil; and

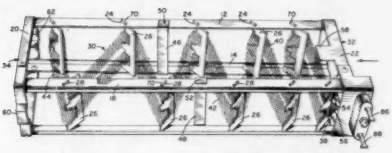
deflection means projecting from said body member adjacent said aperture at a location downstream relative to said aperture when said insulator is located in the path of air for receiving and directing a portion of air through said aperture for dissipating the heat from said coil portion.

3,860,789

HEATING ELEMENT ASSEMBLY

Douglas Herman Maake, Cookeville, Tenn., assignor to Gould Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 344,848, March 26, 1973, abandoned. This application May 6, 1974, Ser. No. 466,871
Int. Cl. H05b 3/06
U.S. Cl. 219—532 21 Claims



1. A resistance heating assembly for heating a fluid moving along a predetermined pathway and including:

a. a plurality of insulators arranged in staggered parallel relationship at the points of reversal of direction along an oscillatory wave path;

b. an elongated electrical resistance material supported by said insulators at intervals along the length of said material, said material being formed as a grid along an oscillatory wave path of decreasing frequency;

c. means for supporting said insulators along said oscillatory wave path; and

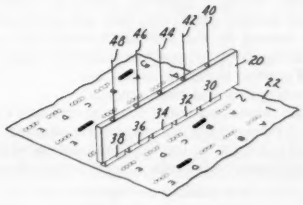
d. electrical terminal means communicating with the extremities of said electrical resistance material.

3,860,790

DATA PROCESSING FORM

Segwald J. Reckdahl, Fridley, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 22, 1973, Ser. No. 325,592
Int. Cl. G06k 7/10, 19/06
U.S. Cl. 235—61.11 E 9 Claims



1. A data processing form having the plurality of printed indication areas of minimum dimensions for use with an optical sensing apparatus which provides a signal in response to the sensing of a mark of said minimum dimensions in a said indication areas,

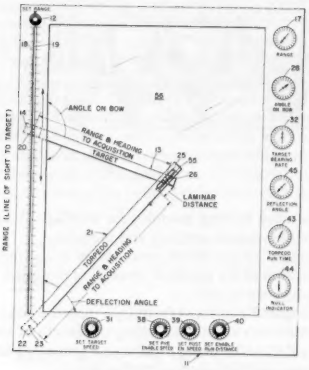
wherein the improvement comprises

each of the indication areas of the form including a gauge comprising a plurality of printed symbols uniformly extending throughout the interior of the minimum dimensions of the indication area, the symbols having a printed area of an optical density selected in relation to the sensitivity of the sensing apparatus such that the sensing apparatus provides a signal indicative of a mark in said indication area when all of the symbols in said indication area are obliterated by the mark.

3,860,791
DEFLECTION ANGLE PLOTTER

Herbert W. Headle, Jr., Middleton, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 13, 1968, Ser. No. 714,167
Int. Cl. G06g *7/80*
U.S. Cl. 235—61.5 T **6 Claims**



1. A device for rapidly solving a plurality of relative motion problems each having a plurality of parameters by vector triangle comprising:

a plotter surface including a frame for accommodating a plurality of electrical controls and indicators;

at least a pair of pivotable and extensible arms mounted adjacent said plotter surface and forming two sides of said triangle for introducing direction and distance parameters into the device;

a portion of one edge of said surface forming the third side of said triangle;

circuit means connected to said arms for converting said parameters into electrical signals;

said electrical controls including means for introducing speed and distance parameters into said circuit means;

the vertex formed by the first and second sides of said triangle being movable omnidirectionally to form a multiplicity of relative motion triangles; and

means for energizing said circuit means,

said circuit means adapted to combine said data inputs to obtain a substantially instantaneous solution of a problem and to provide an indication thereof and of torpedo and target parameters coinciding to form said solution.

3,860,792
METHOD OF IDENTIFYING DIFFERENT DISTANCES BETWEEN MARKINGS ON A DATA RECORD AND A DEVICE FOR PERFORMING THE METHOD

Rune L. Myren, Spanga, Sweden, assignor to Svenska Dataregister AB, Solna, Sweden

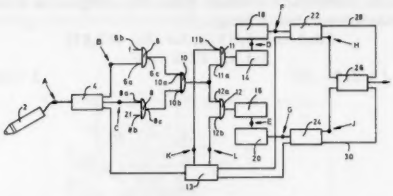
Filed Jan. 22, 1973, Ser. No. 325,600
Claims priority, application Sweden, Jan. 27, 1972, 917/72
Int. Cl. G06k *7/10*
U.S. Cl. 235—61.6 R **25 Claims**

1. Method for identifying different distances between markings on a data record which are read by a reading device movable relative to said data record, which comprises:

sensing the leading and trailing edges of each of two adjacent markings;

calculating the distance between the leading and trailing edges of each of said markings;

calculating the distance between the trailing edge of a first-sensed marking and the leading edge of a second-sensed marking;



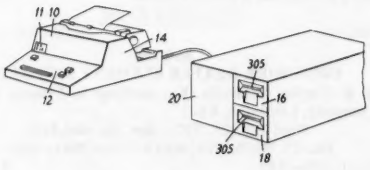
multiplying said first-calculated distances by a predetermined factor and adding thereto said last-calculated distance; whereby

the distance between the center lines of said two adjacent markings is determined.

3,860,793
APPARATUS FOR REPRODUCING PROGRAMMED SELECTIONS OF DATA RECORDED IN CODED FORM ON MAGNETIC CARDS

Malcolm David Roe; John Henry Donald; Peter Lee Chappell; Malcolm Kirk; John David Edwards, and Stanley Keith Greenham, all of Croydon, England, assignors to Dataplex Limited, Croydon, Surrey, England

Filed Aug. 28, 1972, Ser. No. 284,171
Claims priority, application Great Britain, Sept. 1, 1971, 40854/71
Int. Cl. G06k *1/12;* **G01d** *15/06;* **G06k** *3/00, 7/08, 19/06*
U.S. Cl. 235—61.9 R **16 Claims**



1. Apparatus for reproducing programmed selections of blocks of data recorded in coded form in a plurality of separate tracks each occupying one of a plurality of predetermined positions on a magnetic card, the selection of blocks of data being made in accordance with a program of instructions recorded as a series of characters in coded form in a separate block or blocks of characters on the same or another magnetic card, comprising:

program reproducing means including a magnetic card reader for reproducing from the appropriate magnetic card a series of characters representing a program and including a character or group of characters representing the predetermined position on the appropriate magnetic card of the track or tracks containing a selected block of data to be reproduced;

a program storing means connected to the program reproducing means for receiving and storing the series of characters reproduced by the magnetic card reader;

decoding means connected to the program storing means for receiving in sequence the instruction characters stored in the storing means and for decoding each instruction character received from the storing means; and

data reproducing means including a magnetic card reader connected to the decoding means and an address register which can receive the coded character or group of coded characters representing the position of the selected block

of characters recorded on the appropriate magnetic card, and control means operable in response to a decoded instruction from the program storing means to cause the magnetic card reader to reproduce data recorded in the track of the appropriate magnetic card containing the block of data whose position is specified by the character or group of characters held in the address register.

3,860,794

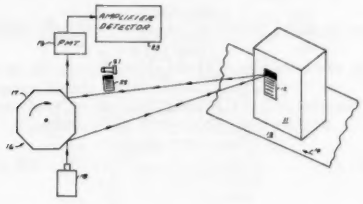
SYSTEM FOR CONVERTING MODULATED SIGNALS TO SQUAREWAVE OUTPUTS

Ronald P. Knockeart, Walled Lake, and John R. Wilkinson, Dearborn, both of Mich., assignors to Bendix Corporation

Continuation of Ser. No. 207,214, Dec. 13, 1971,. This application Sept. 28, 1973, Ser. No. 401,930

Int. Cl. G06k *7/10;* **H03k** *5/00*

U.S. Cl. 235—61.11 E **16 Claims**



1. A system for converting an analog signal which varies between a high amplitude and a low amplitude into a squarewave comprising:

first means for detecting and storing one of said amplitudes;

second means for detecting and storing the other of said amplitudes;

means for averaging the outputs of said first and second means for detecting and generating an average signal representative of the average of said high and low amplitudes;

means for receiving said average signal and said analog signal and generating a squarewave output, said squarewave having a high level when said analog signal rises above said average signal and a low level when said analog signal rises above said average signal and a low level when said analog signal falls below said average signal;

first and second discharge means for respectively discharging said first and second means for detecting at preselected time periods;

and first delay means responsive to the transitions of said squarewave from said high level to said low level and second delay means responsive to the transistions of said squarewave from said low level to said high level, said delays each establishing said preselected time period and said first and second delay means respectively actuating said first and second discharge means to discharge said means for detecting and storing at the end of said preselected time period so that said system is immune to short term noise transitions.

3,860,795

PROGRAMMING GUIDE

Russell C. Morrill, Sylmar, Calif., assignor to Morworth Enterprises, Inc., Van Nuys, Calif.

Filed Apr. 16, 1973, Ser. No. 351,182

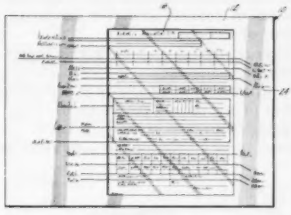
Int. Cl. G06k *19/00*

U.S. Cl. 235—61.12 N **6 Claims**

6. A guide for aiding in the translation of data into a form acceptable to computers, comprising

a sheet having a first section, said first section being substantially transparent, and a second section, said second section being opaque;

printed indicia located on said second section, said printed indicia including predetermined statements used to input data into a computer program; and



guide lines for tying segments of said printed indicia to positions on said first section, said positions being located on said first section to cooperate with data arranged in a predetermined matrices separate from said guide, said printed indicia thereby providing for a direct reading of the separate, data arranged in the predetermined matrices in a form acceptable to a computer.

3,860,796

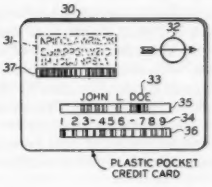
MAGNETICALLY SENSIBLE RECORD AND PROCESS OF PRODUCING SAME

John G. Wallace, Ashland, and Paul H. Kuzia, Westwood, both of Mass., assignors to Synergistics, Inc., East Natick, Mass.

Continuation-in-part of Ser. No. 855,501, Sept. 5, 1969,. This application Dec. 9, 1969, Ser. No. 883,537

Int. Cl. G11b *25/04;* **G06k** *7/08, 19/02, 19/06;* **B41f** *3/36*

U.S. Cl. 235—61.12 M **3 Claims**



1. A process of preparing a magnetically sensible record comprising indenting the surface of a non-magnetic receptor sheet with a linear series of indentations of a density of at least 50 bits per inch arranged in a binary code form, filling said indentations with finely divided particles of a magnetically sensible material and thereafter fixing said particles in place, wherein said record is a pocket credit card and wherein said indentations are arranged in an alpha-numeric binary code form with the background of each bit being free of magnetically sensible material and said record also contains on said surface conventional visually readable information.

3,860,797

ELECTRICAL IMPULSE COUNTER FOR AUTOMATIC CAR WASH AND THE LIKE

Joseph J. Gilboy, 2525 Colton Dr., Richmond, Va. 23235

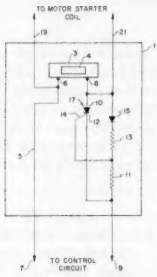
Filed July 20, 1973, Ser. No. 381,072

Int. Cl. G06m *3/12*

U.S. Cl. 235—92 PD **4 Claims**

1. In combination with a car wash system, a counter system comprising:

a. a counter having first and second terminals, said counter registering one count each time said counter is energized and then de-energized;
b. means to connect said first and second terminals of said counter across the starter coil of a motor of said car wash system;
c. first and second conductors coupled to a source of AC power through the control circuit of said car wash system;
d. means to connect said first conductor to said first terminal of said counter;
e. a silicon controlled rectifier having a gate electrode, a cathode and an anode;
f. means to connect said cathode of said silicon controlled rectifier to said second conductor;
g. a first resistor;
h. a second resistor connected in series with said first resistor



i. means to connect said first resistor to said second conductor;
j. a diode connected between said second resistor and said second terminal of counter;
k. means to connect said anode of said silicon controlled rectifier to said second terminal of said counter; and
l. means to connect said gate electrode of said silicon controlled rectifier to the common point of said first and second resistors, whereby triggering said silicon controlled rectifier to its conductive state by the application of a voltage from said source of AC power energizes said car wash motor and energizes said counter to condition said counter to register a count, said counter registering a count when said silicon controlled rectifier returns to its off state.

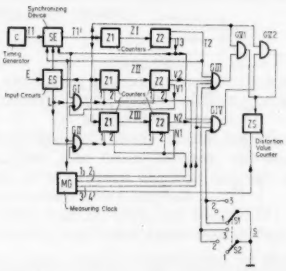
3,860,798

CIRCUIT ARRANGEMENT FOR THE MEASURING OF THE MAXIMAL VALUE OF THE DISTORTION OF A BINARY SERIES OF STEPS DURING AN ADJUSTABLE MEASURING PERIOD

Jurgen Kemper, Zurich, Switzerland, assignor to Siemens Aktiengesellschaft, Postfach, Germany

Continuation of Ser. No. 138,696, April 29, 1971, abandoned. This application May 15, 1973, Ser. No. 360,536
Claims priority, application Germany, May 8, 1970, 2022554
Int. Cl. H03k *21/32*
U.S. Cl. 235—92 PB **4 Claims**

1. Apparatus for measuring the maximum values of distortion of binary signals during an adjustable measuring period, the duration of said binary signals differring from an ideal duration, the appatatus comprising:
timing signal generator means for producing clock pulses,
input means for receiving said binary signals and for regenerating said binary signals,
synchronizing means coupled to said timing signal generator and said input means for producing corrected clock pulses whereby ones of said corrected clock pulses will coincide with edges of said binary signals,
first, second and third counting means controlled by said corrected clock pulses, said first counting means producing output signals at intervals corresponding to said ideal duration, each counting means being adapted to register one count cycle during said ideal duration and having as many counting positions as there are corrected clock pulses within said ideal duration,
means for generating measurement pulses, said measurement pulses coinciding with edges of said received binary signals,
first gate means for receiving said measurement pulses and for coupling same to reset inputs of said second counting means,
second gate means for receiving said measurement pulses and for coupling same to reset inputs of said third counting means,



means connecting an output of said first and said second counting means to an input of said first gate means,
means connecting an output of said first and said third counting means to an input of said second gate means,
whereby upon the occurrence of a leading distorted measurement pulse, there appears over said first gate means a reset signal for said second counting means, and upon the occurrence of a lagging distorted measurement pulse there appears over said second gate means a reset signal for said third counting means,
fourth counting means for counting said corrected clock pulses and indicating a corresponding distortion value and
fourth gating means having as inputs the outputs of said second and third counting means and said corrected clock pulses, said gating means being operable to connect said corrected clock pulses to said fourth counting means during the time said output signals of said second and third counting means are different.

3,860,799

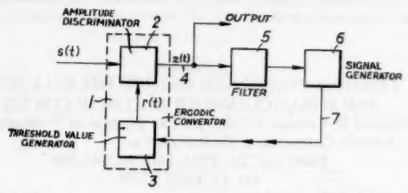
CIRCUIT FOR ERGODIC PROCESSING OF PERIODIC AND APERIODIC SIGNALS

Heinz Donko, Vienna, Austria, assignor to Norma Messtechnik Gesellschaft m.b.H., Vienna, Austria

Filed Apr. 11, 1973, Ser. No. 349,928
Claims priority, application Austria, May 12, 1972, 4180/72
Int. Cl. H03k *3/64, 13/17*
U.S. Cl. 235—150.3 **10 Claims**

1. A circuit for ergodic processing of periodic and aperiodic signals comprising:
at least one ergodic converter including a threshold-value controlled decision unit and a periodic threshold-value signal generator,
a frequency band limited filter connected to the output of said converter, and
a regulation signal generator connected to said filter for receiving the filtered signal and to said threshold-value

generator for causing said threshold-value generator to generate periodic threshold-values of different frequencies to ensure statistical independence of the threshold-value signal and any periodic input signal.



3,860,800

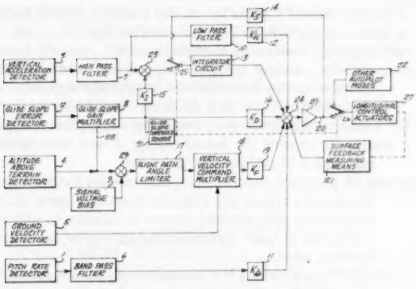
AUTOMATIC PITCH AXIS CONTROL SYSTEM FOR AIRCRAFT

Robert D. Simpson, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 264,119, June 19, 1972, abandoned. This application July 2, 1973, Ser. No. 376,070

Int. Cl. G06g *7/78*; **G01s** *1/18*

U.S. Cl. 235—150.22 **6 Claims**



1. In combination in a pitch axis control system for an aircraft:

glide slope error detector means;

altitude above terrain detector means;

first multiplier circuit means coupled to said glide slope error detector means and said altitude above terrain detector means for providing a first signal representative of actual flight path error of the aircraft;

acceleration detector means;

high pass filter circuit means coupled to said acceleration detector means;

integrator circuit means responsive to said multiplier circuit means and said high pass filter circuit means for providing a second signal representative of the change in vertical velocity of the aircraft;

ground velocity detector means;

second multiplier circuit means coupled to said ground velocity detector means and said altitude above terrain detector means for providing a signal representative of commanded vertical velocity; and,

means responsive to said first multiplier circuit means, said integrator circuit means, and said second multiplier circuit means for providing a signal representative of vertical velocity error.

3,860,801

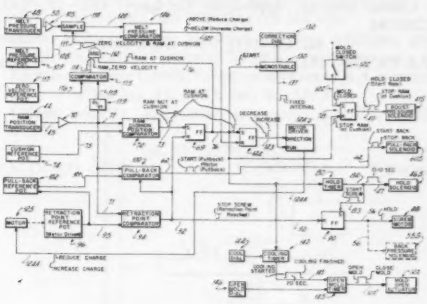
INJECTION MOLDING CONTROL

Denes B. Hunkar, 2530 Vera View Dr., Cincinnati, Ohio 45244

Filed June 19, 1973, Ser. No. 371,390

Int. Cl. G06g *7/66*; **B29f** *1/06*

U.S. Cl. 235—151.1 **15 Claims**



1. In an injection molding machine having a reciprocating ram for injecting a charge of plasticized material from an injection barrel into a mold cavity via an orifice located at the downstream end of said barrel, said ram being reciprocated between a variable retracted position and a fixed forward position, a control system for said ram designed to promote uniform charging of said cavity, said control system comprising:

a signal-controlled ram drive connected in force-transmitting relationship with said ram for advancing said ram toward said orifice from said retracted position to said fixed forward position to inject plasticized material from said barrel into said cavity via said orifice, and from said forward position to said retracted position,

a pressure transducer communicating with said barrel upstream of said orifice for providing a signal correlated to the pressure of plasticized material in said barrel,

a position sensor responsive to the position of said ram for providing a signal correlated to the position of said ram in said barrel,

control means connected to said position sensor for generating a control signal when said ram reaches said forward position, said control signal being coupled to said ram drive means for terminating said ram advancing motion when said ram reaches said forward position,

ram holding means connected in force-transmitting relationship with said ram and responsive to said control signal for holding said ram in said forward position during at least a portion of the time plasticized material injected into said cavity solidifies,

sample means responsive to said control signal for sampling the output signal of said pressure transducer to produce a sampled pressure signal when said ram advancement has substantially terminated at said fixed forward position and injected plastic material in said orifice has not yet solidified, whereby the sampled pressure signal is correlated to the pressure in said cavity and hence to the mass of injected material,

reference signal means for providing a reference signal correlated to a predetermined barrel pressure,

correction means including a comparator responsive to said sampled pressure signal and said reference signal for producing a retraction point correction signal, and

means responsive to said retraction point correction signal for varying said retracted position from which said ram advances to inject plasticized material into said cavity to thereby vary the mass of the succeeding charge of injected material in a manner dependent on cavity pressure at the conclusion of injection of the preceding charge.

3,860,802
METHOD AND APPARATUS FOR ASCERTAINING A STEADY STATE VALUE OF A CONTINUOUSLY VARIABLE MEASURED QUANTITY

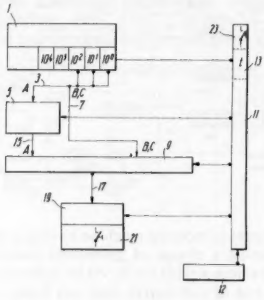
Erich Emil Karl Knothe, Gottingen-Geismar, and Franz-Josef Melcher, Gottingen-Nikolausberg, both of Germany, assignors to Sartorius-Werke GmbH, Gottingen, Germany

Filed Oct. 11, 1973, Ser. No. 405,506

Claims priority, application Germany, Oct. 17, 1972, 2250793

Int. Cl. G01g *9/00;* **G05b** *5/01*

U.S. Cl. 235—151.33 **7 Claims**



1. A method of digitally verifying steady state conditions, i.e., of ascertaining when a quantity which is continuously measured and reported by a measuring instrument attains a steady value after having undergone an abrupt change, which comprises comparing three consecutive sample values (A,B,C) of which one is reported if two values differ from each other by less than a prescribed difference, and repeating the comparison, if necessary, with fresh sample values until the difference condition is satisfied.

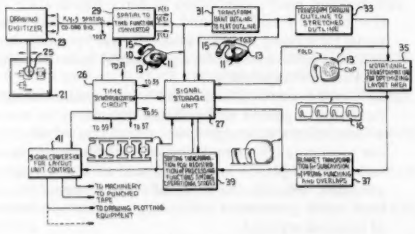
3,860,803
AUTOMATIC METHOD AND APPARATUS FOR FABRICATING PROGRESSIVE DIES

Richard Carl Levine, Plainfield, N.J., assignor to Diecomp, Inc., Plainfield, N.J.

Filed Aug. 24, 1970, Ser. No. 66,533

Int. Cl. B21k *5/20;* **G06q** *7/48*

U.S. Cl. 235—151.1 **41 Claims**



1. In a method for automatically designing by computing apparatus a progressive die for use in manufacturing a specified piecepart of predetermined material, the steps of:

generating electrical co-ordinate signals representative of said piecepart;

transforming said co-ordinate signals to transformed co-ordinate signals representing said piecepart flattened into a sheet of said predetermined material but with a component to accommodate spring back effects of said material;

modifying said transformed co-ordinate signals to modified transformed co-ordinate signals representing said piecepart entirely flattened to compensate for said component; and

storing said co-ordinate signals, said transformed co-ordinate signals, and said modified transformed co-ordinate signals.

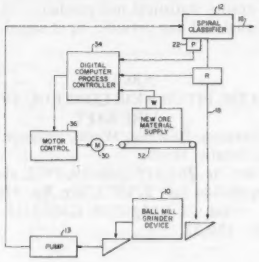
3,860,804
CONTROL SYSTEM AND METHOD FOR BALL MILL AND SPIRAL CLASSIFIER IN CLOSED CIRCUIT

Richard E. Rutman, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 21, 1972, Ser. No. 246,206

Int. Cl. G06f *15/46*

U.S. Cl. 235—151.1 **17 Claims**



1. In a control system for an ore grinding circuit including at least one particle size spiral classifier operative with a ball mill grinding device, the combination of

means for sensing the motor power of said classifier in relation to the ore material passing through said spiral classifier for each of a plurality of iteration periods related to the function operation of said spiral classifier,

means for sensing the actual supply of new ore material to said ball mill grinding device,

stored program control computer means for determining the recycle rate of ore material from said spiral classifier to said ball mill grinding device in relation to said motor power for at least a predetermined one of said iteration periods, and

means for controlling the desired supply of new ore material to said ball mill grinding device for said one iteration period in accordance with a predetermined relationship including said actual supply of new ore material and said recycle rate of ore material.

3,860,805
METHOD AND APPARATUS FOR PRODUCING A FAIRING CONTOUR IN NUMERICAL CONTROL SYSTEMS

Marlene R. Strukel, Farmington, Mich., assignor to The Bendix Corporation

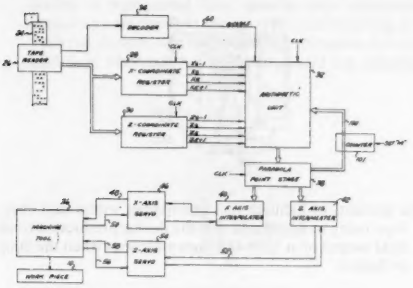
Filed May 7, 1973, Ser. No. 358,203

Int. Cl. G06f *7/38, 15/46*

U.S. Cl. 235—152 **11 Claims**

1. A numerical control apparatus for generating a substantially parabolic fairing contour between first and second successive linear segments of motion of a controlled element comprising: a controlled element, means for controlling the motion of said element along each of at least two independent axes of displacement, a record containing coded representations of the displacements of said element, said record containing coordinates of the loci and slopes of said successive linear segments, said record further containing a representation between said linear segment representations initiating said fairing contour between the end point of said first segment and the initial point of said second segment, means for

sequentially reading the coded representations of said record, means for receiving and storing the coordinates of at least said end point of said first linear segment and at least the coordinates of said initial point of said second linear segment, arithmetic means connected to respond to said fairing contour representation to determine the coordinates of at least one



intermediate point on a parabolic curve passing through said end point and initial point of said first and second linear segments, respectively, said arithmetic means being connected in output relation to said means for controlling the motion of said element so as to cause said element to move linearly between the coordinates of said intermediate points.

3,860,806

ELECTRONIC TAXIMETER HAVING PROGRAMABLE CONSTANT FURNISHING MEANS

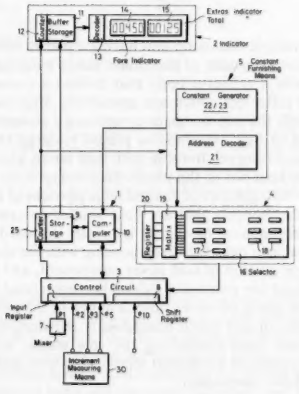
Manfred Fichter, Weiler; Siegfried Spauszus, Villingen, and Ulrich Warkentin, Tannheim, all of Germany, assignors to Kienzle Apparate GmbH, Black Forest, Germany

Filed Jan. 19, 1973, Ser. No. 323,908

Claims priority, application Germany, Jan. 21, 1972, 2202865

Int. Cl. G06b *13/00*

U.S. Cl. 235—168 **18 Claims**



1. An electronic taximeter, comprising, in combination, measuring means for furnishing measuring signals signifying increments of distance traveled and waiting time to be charged to a passenger; indicator means for indicating the fare to said passenger; programmable constant furnishing means for furnishing constants corresponding to predetermined fare rates; and computer and storage means having at least a first input connected to said constant furnishing means, a second input connected to said measuring means and an output connected to said indicator means, for computing said fare at least in part in response to said measuring signals and said constants.

3,860,807

ELECTRONIC TAXIMETER HAVING SERIALLY ENERGIZED INDICATOR MEANS

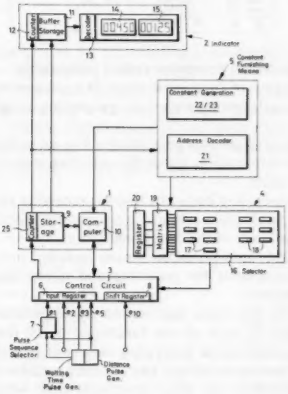
Manfred Fichter, Weiler; Siegfried Spauszus, Villingen, and Ulrich Warkentin, Tannheim, all of Germany, assignors to Kienzle Apparate GmbH, Villingen/Schwarzwald, Germany

Filed Jan. 19, 1973, Ser. No. 323,907

Claims priority, application Germany, Jan. 21, 1972, 2202865

Int. Cl. G07b *13/04*

U.S. Cl. 235—168 **5 Claims**

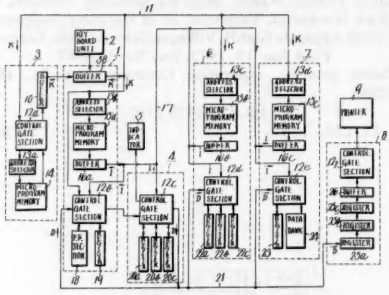


1. Electronic taximeter comprising, in combination, first and second measuring means for furnishing, respectively, a first and second pulse sequence signifying distance travelled and elapsed waiting time, respectively; computer and storage means for computing the fare in response to said first and second pulse sequence, said computer and storage means having a first storage means for storing variables required for computing said fare and additional variables for computing totals required for calculating the pay of the taxi driver; electronic indicator means having a plurality of indicator elements, each adapted to furnish a visual output only in the presence of a signal applied thereto; buffer storage means connected to said first storage means and said indicator means, said buffer storage means having a plurality of buffer storage locations corresponding in number to said plurality of indicator elements, each for storing data received from said first storage means and for applying corresponding signals to a corresponding one of said indicator elements when addressed; and control circuit means for cyclically addressing said buffer storage locations in a predetermined order and at a rate sufficient to effect a visually continuous output from each of said indicator elements.

3,860,808
ELECTRONIC COMPUTER SYSTEM

Shunsuke Sakoda, and Yoshinori Tanaka, both of Kanagawa-ken, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 7, 1973, Ser. No. 357,676
Claims priority, application Japan, May 9, 1972, 47-45647; May 9, 1972, 47-45648
Int. Cl. G06f *7/38*
U.S. Cl. 235—156 **7 Claims**



1. An electronic computer system comprising:

A. a plurality of functional units, at least one of the functional units having means for generating an instructional signal;

B. a keyboard unit for generating a key code signal including an information signal for selecting one of the functional units;

C. a common key code bus line for receiving the key code signal from the keyboard unit and for distributing the same to each of the functional units;

D. key code interpretation means included in each of the functional units for receiving and interpreting the key code signal;

E. separate key code suppression signal generating means included in each of the functional units, the key code suppression signal generating means of one of the functional units generating a key code suppression signal to be distributed to the other functional units when said one functional unit is selected to receive a succeeding key code signal in accordance with the interpretation of the key code signal by the key code interpretation means of said one functional unit; and

F. a key code suppression bus line connected in common to each of the key code suppression signal generating means for receiving the key code suppression signal from the one functional unit and for supplying the same to the rest of the functional units to bar them from operatively receiving the succeeding key code signal.

3,860,809
PHOTOFLASH LAMP-REFLECTOR MODULE AND MINIATURE MULTIFLASH UNITS FOR PHOTOGRAPHIC CAMERAS

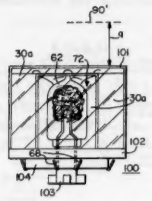
William E. Shoupp, Edgewood; Walter V. Bratkowski, McKeesport, and John N. Esposito, Penn Hills, all of,, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 17, 1973, Ser. No. 380,181
Int. Cl. G03b *15/02*
U.S. Cl. 240—1.3 **20 Claims**

1. A photoflash device comprising the combination of;

a photoflash lamp that has a tubular envelope which contains hafnium fuel and an oxygen fill and is of such diameter and length that the envelope volume is less than 0.6 cc., and

a reflector having an arcuate rear wall portion, that is in nested relationship with the lamp envelope and has substantially flat outwardly-diverging side wall segments that define an opening in the front of the reflector the maximum width dimension whereof is from about 1.2 to 2 times as large as the diameter of the lamp envelope,

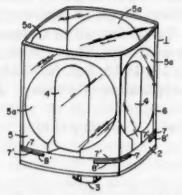


the amounts of hafnium fuel and oxygen within said envelope being so correlated that the device produces a zonal light output of at least **460** lumen-seconds when the lamp is flashed.

3,860,810
MULTIPLE FLASHLAMP UNIT

Josef Lukas, and Dietmar Illig, both of Augsburg, Germany, assignors to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH, Munich, Germany

Filed Aug. 21, 1973, Ser. No. 390,280
Claims priority, application Germany, Aug. 29, 1972, 2242436
Int. Cl. G03b *15/02*
U.S. Cl. 240—1.3 **6 Claims**



1. In a multiple flashlamp unit having a plastic base component that has a plurality of photoflash lamps mounted thereon together with a reflector body that defines a corresponding number of reflectors which are operatively disposed relative to said lamps, the improvement comprising a protective cover component of light-transmissive plastic material that is disposed in enclosing relationship with said lamps and reflector body and is fastened to the plastic base component by at lest one weld which consists of abutted edge portions of said cover and base components that are heat-bonded to one another, said base component having an interiorly disposed shoulder thereon that is in tight-fitted relationship with the abutted and welded edge portion of said cover component, and said weld having at least one notch-like indentation associated therewith that extends along the outer surface of one of the heat-bonded edge portions of said plastic components and along the welded junction, said weld comprising the sole means holding the cover component in assembled relationship with said reflector body and base component.

3,860,811
VARIABLE-BEAM FLASHLIGHT DEVICE

John W. Slauter, 5976 Wedgewood Dr., Mentor, Ohio 44060

Filed Sept. 17, 1973, Ser. No. 397,673
Int. Cl. F21l *15/02*
U.S. Cl. 240—10.6 R **14 Claims**

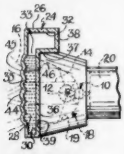
1. A flashlight device for producing a light beam of variable width and intensity comprising,

a body,

a light assembly including a light source mounted on said body for directing light rays in generally one direction from said light source to produce a light beam,

lens means supported by said body for selectively altering the direction of said light rays,

said lens means comprising a hollow sealed compartment having a transparent fluid therein, said compartment including a transparent lens chamber for receiving a fluid material therein, and a fliud storage chamber for storing said fluid when it is not disposed in said lens chamber



said lens chamber being mounted in the path of said light rays and defining when empty a solid lens for causing said light rays to form a beam of one width and one intensity, said fluid storage means being mounted out of the path of said light rays and connected in fluid communication with said lens chamber to enable selective transfer of said fluid material between and fluid storage chamber and said lens chamber, and

said fluid material defining a movable lens when disposed in said lens chamber and co-acting with said solid lens to cause said light rays to form a beam having another width and another intensity.

3,860,812

DIFFUSING SCREEN FOR PHOTOGRAPHIC LIGHTING

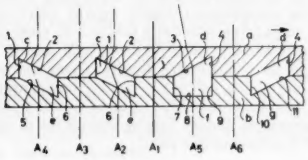
Arthur Schneider, Volkenrode, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed Oct. 9, 1973, Ser. No. 404,717

Claims priority, application Germany, Oct. 7, 1972, 2249241

Int. Cl. F21v *11/18*

U.S. Cl. 240—46.03 **7 Claims**



1. A light diffusing screen adapted to extend across the front of a photographic lighting unit to control the diffusion of light from such unit onto a field to be photographed, said screen comprising means for varying the lateral spread of light passing through said screen, said screen having two layers of transparent material lying one on top of the other, one layer being slidable parallel to the surface of the other, each layer having an uneven surface structure on the surface thereof which faces the other layer with the uneven surfaces of the two layers substantially in contact with each other, the uneven surface structures of at least one of the layers comprising a prismatic structure having a plurality of slots having substantially the same wedge angles, the wedge angles of the slots on one side of the approximate center of the screen being in the opposite direction from those on the other side of said center.

3,860,813

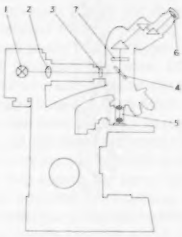
BEAMSPLITTER AND VERTICALLY ILLUMINATED FLUORESCENT MICROSCOPE USING THE SAME

Friedrich Herzog, Pfaffenbergengasse 7/4/1, and Franz Twaroch, Schweizertalstrasse 8/3/9, both of Vienna, Austria

Filed Oct. 31, 1973, Ser. No. 411,585

Int. Cl. G02b *21/00*

U.S. Cl. 350—91 **6 Claims**



1. A beamsplitter for transmitting a substantial majority of 45° incident light having a wavelength of 520nm to 530nm and 580nm to 590nm and reflecting a substantial majority of 45° incident light having a wavelength of 400nm to 500nm and 540nm to 570nm comprises a planar glass plate having an index of refraction of 1.37 to 1.67 with a plurality of superimposed coatings having the following values:

	Index of Refraction	Coating Thickness In Nanometers
air		
	n_1 = 2.10 to 2.65	151–185
	n_2 = 1.25 to 1.50	169–207
	n_3 = 2.10 to 2.65	295–361
	n_4 = 1.25 to 1.50	161–197
	n_5 = 2.10 to 2.65	288–352
	n_6 = 1.25 to 1.50	161–197
	n_7 = 2.10 to 2.65	288–352
	n_8 = 1.25 to 1.50	161–197
	n_9 = 2.10 to 2.65	288–352
	n_{10} = 1.25 to 1.50	161–197
	n_{11} = 2.10 to 2.65	144–176
glass.		

3,860,814

LIGHT COLLECTING AND TRANSMITTING APPARATUS

Daniel M. Klang, 3 Golden St., Huntington Station, N.Y. 11743, and Roger Mosciatti, 6 Wycomb Pl., Coram, N.Y. 11727

Division of Ser. No. 198,588, Nov. 15, 1971, Pat. No. 3,758,197. This application June 15, 1973, Ser. No. 370,230

Int. Cl. G02b *5/14*

U.S. Cl. 250—227 **16 Claims**

1. In a tape transport, apparatus for sensing the length of a tape loop in a tape storage column, comprising:

means for directing light along a continuous length of a tape storage column; a photosensitive device, a longitudinally extending bar composed of light conducting material, said photosensitive device being positioned beneath the base portion of said bar, said bar including means for collecting the light incident along the entire length of said bar received from said directing means and reflecting the light onto said single photo-sensitive device; said directing means and said bar being positioned at the boundaries of the tape storage column such that the tape loop whose length is to be sensed is positioned between said directing

means and said bar; said bar including means for providing a linear output from said photosensitive device which

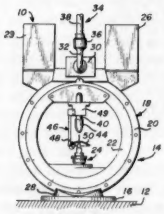
is directly proportional to the linear position of the tape in the storage column.

3,860,815

X-RAY DIFFRACTOMETER HAVING MEANS FOR COOLING CRYSTAL MOUNTED THEREON

Hugh John Hall, Los Altos, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Oct. 24, 1973, Ser. No. 409,098
Int. Cl. G01n *23/20*
U.S. Cl. 250—272 **7 Claims**



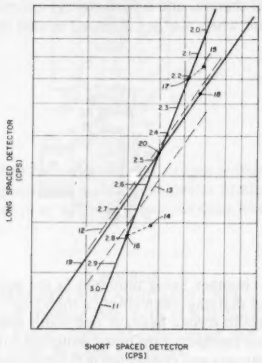
6. Means for directing the flow of a cooling fluid about a mounted crystal in an X-ray diffractometer, the X-ray diffractometer including a goniometer assembly including a full-circle having an outer ring and a movable inner ring and a rotatable goniometer head mounted on the movable inner ring for holding and supportitng a crystal to be analyzed; said flow directing means comprising an input member adapted to be secured to the outer ring of the full-circle and an output member adapted to be secured to the movable inner ring of the full said output member having a component part thereof directed so that flow of the cooling fluid therefrom is at all times in a fixed relationship with the ϕ-axis of the X-ray diffractometer on which the crystal is mounted, whereby, during cooling, the mounted crystal is uniformly bathed in the flow of the cooling fluid; and means, adapted to be secured to the movable inner ring of the full-circle without attachment to the rotatable goniometer head, for deflecting the flow of cooling fluid after the cooling fluid passes the mounted crystal whereby the goniometer head remains frost-free during data collection.

3,860,816

PORTABLE ENVIRONMENTAL CALIBRATORS FOR COMPENSATED DENSITY LOGGING INSTRUMENTS

Billy F. Wilson, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 1, 1971, Ser. No. 119,697
Int. Cl. G12b *13/00;* **G01v** *5/00*
U.S. Cl. 250—252 **9 Claims**



1. A method of calibrating a compensated density logging instrument by the establishment of a spine-and-ribs plot, comprising the steps of: providing a filter recess in a first calibration block, positioning an amount of filter material in said filter recess sufficient to cause the compensated density logging instrument to have a response that will produce a first point on the spine of the spine-and-ribs plot, providing a filter recess in a second calibration block, positioning an amount of filter material in said filter recess sufficient to cause said compensated density logging instrument to have a response that will produce a second point on the spine of the spine-and-ribs plot, positioning said first calibration block proximate the detector portion of the compensated density logging instrument, adjusting the compensated density logging instrument to produce an output coincident with said first point on the spine of the spine-and-ribs plot, removing said first calibration block from the compensated density logging instrument, positioning said second calibration block proximate the detector portion of the compensated density logging instrument, adjusting the compensated density logging instrument to produce an output coincident with said second point on the spine of the spine-and-ribs plots removing said second calibration block from the compensated density logging instrument, positioning one of the calibrators on the compensated density logging instrument in a 180° reversed position and adjusting the compensated density logging instrument to establish the ribs of the spine-and-ribs plot.

3,860,817

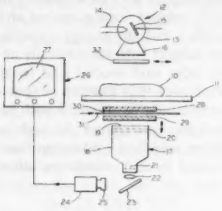
REDUCING PATIENT X-RAY DOSE DURING FLUOROSCOPY WITH AN IMAGE SYSTEM

Ronald Eugene Carmean, Greendale, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 10, 1973, Ser. No. 387,358
Int. Cl. G01t *1/16*
U.S. Cl. 250—320 **23 Claims**

1. In an x-ray system including an x-ray source for producing an x-ray beam having a broad photon energy band and an x-ray detector means spaced remotely therefrom for intercepting radiation that is transmitted through an examination object interposed in the beam, an absorber also intervening between such examination object and said detector means and interfering with radiation intercepted by said detector means and a filter interposed in said beam between said source and

examination object, the improvement for reducing x-ray dosage to the examination object wherein said filter comprises:



a. a substantial quantity of the same constituent as the principal absorbing constituent in the interfering absorber.

3,860,818

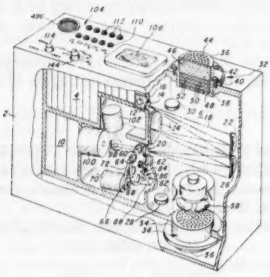
ATMOSPHERIC POLLUTION MONITOR

Arnold F. Stalder, and David W. Mueller, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 248,177, April 27, 1972, abandoned. This application Nov. 26, 1973, Ser. No. 419,003

Int. Cl. G01n *21/26, 21/34*

U.S. Cl. 250—343 **3 Claims**



1. A device for monitoring a fluid sample comprising:

a. a compartmentalized housing including compartments for a sample signal electronic processing circuit including an alarm means and sample concentration indicating meter and an infrared source, a sampling chamber, a detector means and optics package, and a power supply, said sampling chamber including an intake means for continuously drawing a fluid sample into the chamber and an exhaust means for continuously exhausting the fluid sample from the chamber;

b. an infrared source mounted in the electronic processing circuit compartment of said housing, said infrared source being shielded from the electronic processing circuit;

c. a multipass mirror system mounted in the sampling chamber of said housing in the path of electromagnetic energy emanating from the source to form an optical path of selected length through an optics package to a detector, said selected length of the optical path providing increased absorption of the electromagnetic energy;

d. an optics package mounted in said detector means and optics package compartment of said housing, said optics package including a rotatable filter/chopper wheel and means for rotating the filter/chopper wheel, said filter/chopper wheel including a plurality of filters operative in the infrared frequency range, a plurality of filters operative in the visible frequency range, and a reference filter, said plurality of filters equally spaced one from the other and from the center of the wheel and mounted in apertures provided therefor in the wheel, the portion of said wheel between filters forming a base line sampling area, said plurality of filters having diameters such that the aperture of energy impinging thereon is approximately one-third the diameter of the filter whereby sampling is at the top of a square wave or spike-flat top control signal with those filters operative in the infrared frequency range having half intensity widths of 1.5 micron, and those operative in the visible frequency range having half intensity widths ± 15A about the strong absorption wavelengths for component filters and the nonabsorbing region of the reference filter, a plurality of start and stop apertures formed in the filter/chopper wheel some adjacent the wheel periphery and some adjacent the wheel center, said apertures adjacent the wheel periphery being positioned in pairs between each filter to provide timing signals for base line sampling prior to sampling the following filter and said apertures adjacent the wheel's center being positioned in pairs in relation to each filter to provide start and stop signals for sampling the filters and a synchronization aperture for resetting the control electronics each revolution of the filter/chopper wheel, and a bifurcated yoke means through which the filter/chopper wheel extends, said yoke means including in one bifurcation light sources and in the second bifurcation light detector means operative in response to light passing through the filter/chopper wheel apertures to produce electrical signals for operational control;

e. a detector means mounted in the detector/optics compartment of the housing in the optical path for the infrared energy, said detector means including a beamsplitter for reflecting visible light to a first detector and transmitting infrared energy to a second detector, said detectors operative to produce electrical signals responsive, respectively, to received light and infrared energy;

f. an electronic signal processing circuit mounted in the electronic signal processing circuit compartment of the housing comprising a plurality of sample and hold circuits and a control unit including a multiplexer, said plurality of sample and hold circuits operative responsive to the multiplexer control signals of the control unit to sample the detector outputs for each of the filter outputs, a plurality of difference amplifiers selectively coupled to the outputs of the sample and hold circuits for differencing between sample signals and reference signals to produce signals representative of the samples concentrations; threshold and detection channel circuits having inputs coupled to the difference amplifiers, and monitoring means including an alarm coupled to the channel outputs for selectively monitoring the sample concentrations; and

g. a power supply mounted on the power supply compartment electrically coupled to power the electrical components and circuits including the infrared source, sampling chamber intake and exhaust means, and the electronic signal processing circuit.

3,860,819

CLOSED-CIRCUIT-TV-X-RAY MICROSCOPE

Nikolai Vasilievich Rabodzei, Institutskaya ulitsa, 6-a, kv. 39; Vladimir Alexandrovich Astrin, Institutskaya ulitsa, 12, kv. 19; Nina Vasilievna Kuzmicheva, Institutskaya ulitsa, 21, kv. 31; Gennady Vladimirovich Shidlovsky, Tsentralnaya ulitsa, 2-a, kv. 56; Evgeny Mikhailovich Ljubimov, ulitsa Tsentralnaya, 19, kv. 12, and Mikhail Nikolaevich Nadobnikov, ulitsa Voxalnaya, 21, kv. 7, all of Fryazino Moskovskoi Oblasti, U.S.S.R.

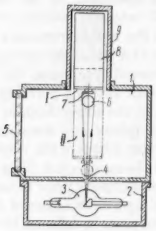
Filed June 29, 1970, Ser. No. 50,431

Int. Cl. G01n *23/00*

U.S. Cl. 250—358 **1 Claim**

1. A closed-circuit-TV X-ray microscope, comprising; an X-ray source; a shielding capsule containing said X-ray source; a shielding object chamber having a common wall with

said shielding capsule; an aperture in said wall for passing an X-ray beam from said X-ray source into said shielding object chamber; a converter for converting X-ray shadow images of an object located between said source and said converter into TV signals, said X-ray-TV converter and said object adapted to be positioned in said object chamber in the path of the



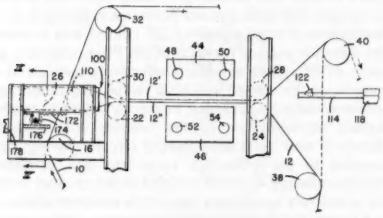
X-ray beam and being movable along the axis thereof; and an enclosure permanently connected to said object chamber and extending through an aperture therein, said X-ray-TV converter being rigidly supported within said enclosure, said enclosure and the X-ray-TV converter supported therein being jointly movable through said aperture into said object chamber.

3,860,820

FILM THICKNESS MEASURING METHOD AND APPARATUS

Daniel J. Ryan, Chester, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Filed May 29, 1973, Ser. No. 364,884
Int. Cl. G01t *1/16*
U.S. Cl. 250—360 **8 Claims**



1. A method of using a radiation gauge for measuring transverse thickness variations in running sheet comprising traversing the gauge having a radiation detector spaced from a radiation source along a path extending transversely of and in thickness measuring proximity to the running sheet, and directing a multiple thickness of the sheet between the radiation detector and the radiation source of the gauge across the path traversed by the gauge, the multiple thickness of the sheet increasing the sensitivity of the gauge to transverse thickness variations of the sheet.

3,860,821

IMAGING SYSTEM

Harrison H. Barrett, Lexington, Mass., assignor to Raytheon Company, Lexington, Mass.

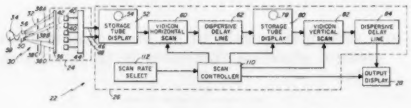
Division of Ser. No. 77,459, Oct. 2, 1970, Pat. No. 3,748,470.
This application Nov. 2, 1972, Ser. No. 303,167
Int. Cl. G01t *1/20*
U.S. Cl. 250—363 **24 Claims**

1. A method of photographing a subject comprising the steps of:

illuminating said subject with a radiant energy emanating from one of a plurality of spaced apart sites of said radiant energy, said radiant energy being capable of propagating through said subject with substantially no diffraction;

illuminating said subject from a second and from a third of said sites with a radiant energy capable of propagating through said subject with substantially no diffraction, said illuminating from said second and from said third sites being directed such that a region of space external to said subject is commonly illuminated with said radiant energies which have propagated through said subject and emanated from said first, said second and said third sites;

inserting a mask in said commonly illuminated region of



space, said mask having regions substantially transparent to said radiant energy spaced apart by regions relatively opaque to said radiant energies;

imparting a relative motion between said mask and said subject;

positioning a radiation detector in spaced apart relation to said mask and at a side of said mask away from said subject, the depth of said mask being sufficiently small relative to the widths of said transparent regions to permit illuminating radiant energy emanating from separate ones of said sites to impinge upon a common point of said detector; and

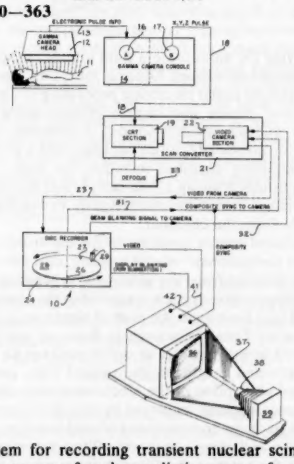
recording the intensities of said radiant energies propagating in said commonly illuminated region of space.

3,860,822

SYSTEM FOR RECORDING AND INTEGRATING TRANSIENT NUCLEAR SCINTILLATIONS

Robert C. Owens, Jr., Palos Verdes Peninsula, Calif., assignor to Vas Ltd., Torrance, Calif.

Filed Jan. 10, 1973, Ser. No. 322,370
Int. Cl. G01t *1/20*
U.S. Cl. 250—363 **3 Claims**



1. A system for recording transient nuclear scintillations comprising a source of nuclear radiation, means for detecting and converting the radiation into an electronic display of random scintillating sensible dots disposed with respect to horizontal and vertical axes upon a display, a video camera disposed in alignment with said display for viewing said dis-

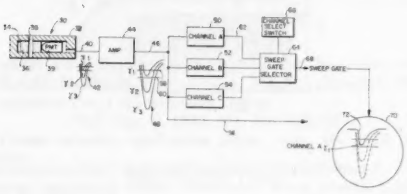
play, a cyclically moving record medium, a video sync pulse recorded on said medium, means for unblanking said camera to discharge accumulated representations of said scintillations stored on the target of said camera to be recorded as a video field on a track of said medium in a manner to be reproduced between successive said sync pulses.

3,860,823

GAMMA RAY SPECTROMETER DISPLAY MEANS

Samuel H. Luitwieler, Jr., La Habra, and Paul R. Klein, Laguna Niguel, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 26, 1973, Ser. No. 344,740
Int. Cl. G01t *1/20*
U.S. Cl. 250—369 **12 Claims**



1. In radiation source measuring apparatus, the combination comprising:

means for detecting the radiant energy emanating from a source;

display means including a cathode ray tube;

means coupled to said detector means for selecting a portion of the range of radiant energy emanating from said source;

means for biasing the beam of the cathode ray tube off the face of said tube;

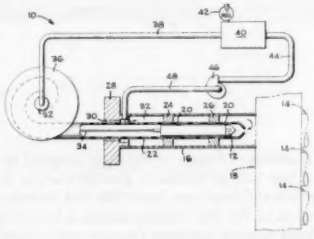
means coupling said detecting means to said display means for driving the beam of said tube in a first direction; and means responsive to said selecting means for deflecting the beam onto the face of said tube, for unblanking said tube and for driving the beam in a second direction transverse to said first direction to display on said cathode ray tube a trace indicative of only the portion of the range of radiant energy selected by said selecting means.

3,860,824

FLUID DRIVEN IN-CORE FLUX MAPPING PROBE SYSTEM

Gerald P. Stone, Saratoga, Calif., assignor to Nuclear Services Corporation, Campbell, Calif.

Filed Oct. 23, 1973, Ser. No. 408,621
Int. Cl. G21c *7/00*
U.S. Cl. 250—390 **10 Claims**



1. A system for moving a probe in a guide member, comprising:

a. a sheath extending into said guide member and including means for supporting said probe to dispose the tip of said probe in one end of said sheath,

b. seal means mounted between said sheath and an inner surface of the guide member and forming an expansion chamber therebetween, said seal means engaging said sheath and said guide member for sealing the fluid flow between said expansion chamber and a second chamber receiving the tip of said probe, and

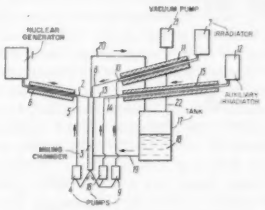
c. means for varying the fluid pressure between said expansion chamber and said second chamber for establishing a fluid pressure differential between said expansion chamber and said second chamber to move said probe relative to said guide member.

3,860,825

RADIATION CIRCUIT HYDRAULIC SYSTEM FOR NUCLEAR REACTORS AND THE LIKE

Valdis Valdovich Gavar, ulitsa Teatra, 48, kv. 3, Latvyskaya SSR, Jurmala, Maiori; Alexandr Stanislavovich Dindun, ulitsa Miera, 16, kv. 41, Latvyskaya SSR, Rizhsky raion, Salaspils; Mark Maximovich Kramer, ulitsa Suvorova, 6, kv. 3, Riga; Ernest Yanovich Platatsis, ulitsa Miera, 16, korpus 7, kv. 18; Artur Eduardovich Mikelson, ulitsa Miera, 16, kv. 36, both of Latvyskaya SSR, Rizhsky raion, Salaspils, and Elmar Yanovich Tomson, ulitsa Zalkshu, 12, kv. 7, Riga, all of U.S.S.R.

Filed Mar. 2, 1973, Ser. No. 337,733
Int. Cl. G21c *19/20*
U.S. Cl. 250—430 **2 Claims**



1. A radiation circuit comprising an activity generator; an irradiator; a mixing chamber arranged so that its upper section is below the lower parts of the activity generator and irradiator; an activity carrier; a tank for storing said activity carrier communicating with said mixing chamber; two pumps for the circulation of said activity carrier; the upper section of said mixing chamber communicating with the outlets of said activity generator and irradiator; the lower section of said mixing chamber communicating through one of said pumps with the inlets of said activity generator and through other said pump, with the inlet of said irradiator.

3,860,826

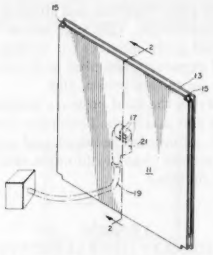
X-RAY CASSETTE

James H. Somerset, Syracuse, N.Y., assignor to Biomechanics, Inc., Syracuse, N.Y.

Filed Feb. 28, 1973, Ser. No. 336,407
Int. Cl. G03b *41/16*
U.S. Cl. 250—480 **2 Claims**

1. In a cassette for taking X-ray radiographs including a front plate and back plate defining an interior chamber, at least one fluorescent screen positioned in the interior chamber of the cassette, and wherein an X-ray film is adjacent said fluorescent screen in said interior chamber, the improvement comprising, a plurality of holes through said back plate, a resilient foam material capable of expanding and contracting positioned over the interior surface of said back plate to act on said fluorescent screen and X-ray film, and means for

passing pressurized gas through said holes or creating a suction through said holes, said holes extending from the exterior



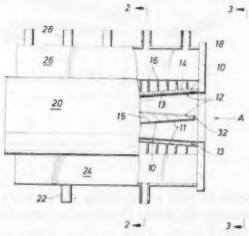
of the cassette to said resilient foam material and said fluorescent screen positioned between said resilient foam material and said X-ray film.

3,860,827

NEUTRON GENERATOR TARGET ASSEMBLY

Lawrence Cranberg, Austin, Tex., assignor to Lawrence Cranberg, Austin, Tex.

Filed Sept. 5, 1972, Ser. No. 286,402
Int. Cl. H01j *39/22*
U.S. Cl. 250—499 **6 Claims**



1. A fluid-cooled neutron generator target assembly for supporting neutron emissive target in an ion beam to produce a flux of neutrons, comprising:

a target support member having:

a first target-supporting surface defining the exterior surface of a conic section;

a second target-supporting surface defining the interior surface of a frustoconical section coaxial with, surrounding, and intersecting said first target-supporting surface to define a conic target-supporting surface having a generally V-shaped cross section for supporting a layer of neutron emissive target material to produce a neutron flux generally collimated parallel to said conic axis when the target is bombarded by an ion beam parallel to said axis;

a first cooling surface in thermal contact with said first target-supporting surface; and

a second cooling surface in thermal contact with said second target-supporting surface; and

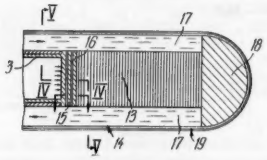
means for flowing a cooling fluid over said cooling surfaces to remove energy imparted to the target material by the ion beam and to maintain the target material at a desired temperature.

3,860,828

PULSED NEUTRON SOURCE

Atlant Anatolievich Vasiliev, Leningradsky prospekt, 14, kv. 129; Rakhim Ainudinovich Mescherov, Peschanaya ulitsa, 15, kv. 20; Boris Pavlovich Murin, Baltiiskaya ulitsa, 4, kv. 85, all of Moscow, and Jury Yakovlevich Stavissky, Sportivnaya ulitsa, 3, kv. 9, Obninsk Kaluzhskoi oblasti, all of U.S.S.R.

Filed Aug. 30, 1972, Ser. No. 284,968
Claims priority, application U.S.S.R., May 10, 1972, 1778710
Int. Cl. G21g *3/04*
U.S. Cl. 250—501 **2 Claims**



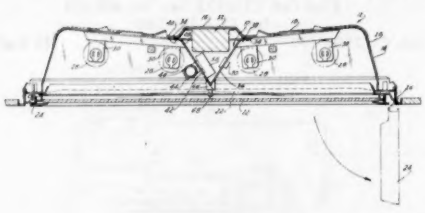
1. A pulsed neutron source comprising a high-current negative hydrogen ion H^- accelerator which shapes and accelerates H^- bunches having a preset duration and repetition interval to the energy of ca. 0.4–1 GeV; a bunching storage ring for proton bunches, the revolution period of said proton bunches on the orbit of said bunching storage ring being a multiple of the repetition interval of said H^- bunches; a charge-exchange injecting system having an inlet end, said H^- bunches from said accelerator being directed into said inlet end, said H^- bunches being converted in said charge-exchange system into proton bunches injected into said bunching storage ring; a phasing cavity system for stabilizing the shape of proton bunches, which are formed and circulate in said bunching storage ring; a system for extracting said proton bunches from said bunching storage ring; and an external neutron-producing target made of a material selected from the group consisting of elements having an atomic weight greater than 80, said proton bunches being ejected onto said target to yield neutron pulses.

3,860,829

FLUORESCENT FIXTURE AUXILIARY LIGHT

William C. Fabbri, Billerica, Mass., assignor to Keene Corporation, New York, N.Y.

Filed Aug. 10, 1973, Ser. No. 387,386
Int. Cl. H02j *7/00*
U.S. Cl. 307—66 **6 Claims**



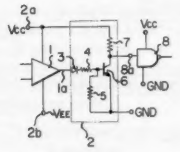
1. In a fluorescent fixture of the type adapted to be connected to a line voltage source to provide current to at least one conventional fluorescent light bulb and including means for connection to the line voltage source; a fixture rear wall; an open front section opposite the rear wall; a ballast well recessed in the rear wall; securing means formed in the rear wall; and a ballast well cover removably attached to the rear wall securing means overlying and covering the ballast well;

the improvement comprising: an elongated cover member; securing means attached to said elongated cover member to mate with said rear wall securing means to removably secure said elongated cover member to said rear wall when said ballast well cover is removed from said rear wall; a self contained power source attached to said elongated cover member; light bulb mounting means attached to said cover member; switch means secured to said cover member and interconnecting said bulb mounting means and self contained power source, said switch means normally being held in an OFF position and adapted to switch to an ON position in the event of a disruption of said line voltage source so as to provide an auxiliary lighting unit which can readily be removed from one fixture for attachment to another fixture as required to convert the fixture to which it is attached to an emergency lighting fixture.

3,860,830
INTERFACE CIRCUIT

Sugiura, Akio, Nagoya; Okamoto, Atsutoshi, Toyohashi, and Suzuki, Motoyoshi, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Aichi-ken, Japan

Filed Mar. 6, 1973, Ser. No. 338,609
Claims priority, application Japan, Mar. 10, 1972, 47-25093
Int. Cl. H03k *17/60*
U.S. Cl. 307—253 **8 Claims**

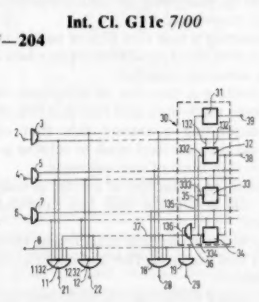


5. The combination according to claim **2**, wherein said transistor has a base connected to said diode, an emmiter connected to the ground potential, and a collector connected to said digital circuit.

3,860,831
LOGIC CIRCUIT, IN PARTICULAR A DECODER, WITH REDUNDANT ELEMENTS

Karl Goser, Muenchen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Oct. 6, 1972, Ser. No. 295,584
Claims priority, application Germany, Oct. 12, 1971, 2150836
Int. Cl. G11c *7/00*
U.S. Cl. 307—204 **6 Claims**

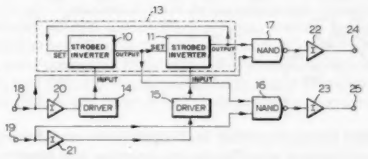


1. A logic device comprising: an output logic circuit; an input logic circuit connected to said output logic circuit for receiving signals corresponding to said output logic circuit; a redundant output logic circuit for replacing said output logic circuit when the latter becomes faulty; and an associative memory element for storing the address of said input logic circuit, said associative memory element connected to said input logic circuit, to said output logic circuit and to said redundant output logic circuit and operable only in response to the operation of said input logic circuit when said address is stored in said associative memory element to inhibit operation of said output logic circuit and effect operation of said redundant output logic circuit as a replacement for said output logic circuit.

3,860,832
BIONIC LOGIC DEVICE

Aarno Aapro, Orrville, Ontario, Canada, assignor to Bionic Industries Limited, Ontario, Canada

Filed July 2, 1973, Ser. No. 376,010
Int. Cl. H03k *5/20*
U.S. Cl. 307—232 **10 Claims**



1. A sequence responsive device comprising at least one latch means which comprises a first strobed inverter means and a second strobed inverter means, each of said first and second strobed inverter means having an input terminal, a set terminal and an output terminal, said set terminal of said first strobed inverter means being connected to the output terminal of said second strobed inverter means and said set terminal of said second strobed inverter means being connected to the output terminal of said first strobed inverter means, the input terminal of said first strobed inverter means being connected to a first driver means adapted to provide an actuation signal to said first strobed inverter means, said first driver means being operatively actuated by a first input signal, the input terminal of said second strobed inverter means being connected to a second driver means adapted to provide an actuation signal to said second strobed inverter means, said second driver means being operatively actuated by a second input signal, a first NAND gate and a second NAND gate, each of said NAND gates having a first input terminal, a second input terminal and an output terminal, the output terminal of said first strobed inverter means being connected to the first input terminal of said second NAND gate, the output terminal of said second strobed inverter means being connected to the first input terminal of said first NAND gate, said second input terminal of said first NAND gate being operatively connected to receiving said first input signal, and said second input terminal of said second NAND gate being operatively connected to receive said second input signal whereby an output signal is manifested at the output terminal of a selected one of said first or second NAND gate indicative of the sequence of actuation of said first input signal and second input signal.

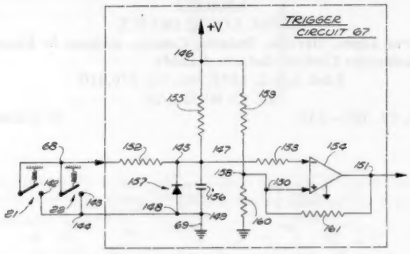
3,860,833
PULSE DISCRIMINATOR TO PREVENT CONTACT BOUNCE

Walter Fah Min Tyau, Orange, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 304,997, Nov. 9, 1972, Pat. No. 3,832,883. This application Jan. 21, 1974, Ser. No. 435,259
Int. Cl. H03k *17/00*
U.S. Cl. 307—247 A **2 Claims**

1. A pulse discrimination circuit comprising: first and second input leads; a switch connected between said leads, said switch having a pair of contacts; first and second resistors; a

capacitor, said capacitor and said first resistor being connected in series between said leads; and a D.C. source of potential, said source and said second resistor being connected in series with said capacitor, said first resistor having a smaller resistance than that of said second resistor, closure of said switch causing a pulse to appear across said capacitor, the higher resistance of said second resistor preventing said capacitor from charging at a high rate and subsequently discharging again because of any bounce of said any contact during one single actuation of said switch; and a regenerative amplifier connected across said capacitor, said regenerative



amplifier having hysteresis, said regenerative amplifier including a differential amplifier having inverting and noninverting inputs and an output, and a third resistor connected from the output to the noninverting input of said differential amplifier, a main junction connected to said noninverting input, a fourth resistor connected from said main junction to the junction of said second resistor and said source, a fifth resistor connected from said main junction to said second lead, said second lead being connected to a point of reference potential, said differential amplifier being referenced to said point, and means connecting said inverting input from the junction of said capacitor and said first resistor.

3,860,834

MULTISTABLE CIRCUIT ARRANGEMENT

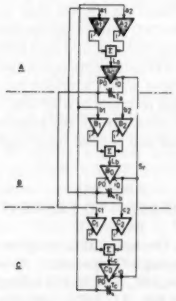
Theo Stutz, Bassersdorf, and Albert Muller, Uster, both of Switzerland, assignors to Contraves AG, Zurich, Switzerland

Filed July 13, 1973, Ser. No. 379,193

Claims priority, application Switzerland, Aug. 4, 1972, 11560/72

Int. Cl. H03k *3/29*

U.S. Cl. 307—289 **6 Claims**



1. A multistable circuit arrangement comprising a multiplicity *n* of storage stages each operatively associated with a respective coupling means in a one-to-one correspondence, the value of *n* being equal at least to three, a common lead, each coupling means comprising an impedance element with first and second terminals thereof between which an impedance value is variable by actuation of the coupling means, each storage stage having first and second operating states and comprising a main amplifier provided with input and output terminals between which in the first operating state an amplified signal is transferred through the main amplifier and in the second operating state the signal transfer through the main amplifier is blocked, each main amplifier having one output terminal connected to the common lead, each coupling means having its first terminal connected to the common lead and its second terminal connected to an input terminal of a main amplifier in each storage stage except its own operatively associated storage stage, any given selected storage stage operating in one given operating state and the remaining storage stages operating in the other operating state.

3,860,835

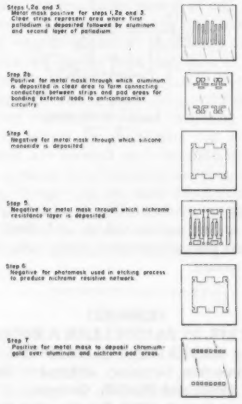
ANTI-COMPROMISE MICROELECTRONIC CIRCUIT

Barbara J. Brymer, San Antonio, Tex.; Edward J. Kapp, and Frank Z. Keister, both of San Pedro, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 10, 1971, Ser. No. 114,344

Int. Cl. H03k *19/168*

U.S. Cl. 307—298 **9 Claims**


Steps 1,2a, and 3.
Metal mask positive for steps 1,2a and 3. Clear strips represent area where first palladium is deposited followed by aluminum and second layer of palladium.
Step 2b.
Positive for metal mask through which aluminum is deposited in clear area to form connecting conductors between strips and pad areas for bonding external leads to anti-compromise circuitry
Step 4
Negative for metal mask through which silicone monoxide is deposited.
Step 5.
Negative for metal mask through which nichrome resistance layer is deposited.
Step 6
Negative for photomask used in etching process to produce nichrome resistive network.
Step 7
Positive for metal mask to deposit chromium-gold over aluminum and nichrome pad areas.

6. A method of producing an anti-compromise thin film circuit module comprising:

vacuum depositing a first thin film of palladium through a stainless steel mask of parallel strips on a face of electrical insulating substrate material;

vacuum depositing a thin film of aluminum through said stainless steel mask onto said first thin film of palladium;

vacuum depositing a second thin film of palladium through said stainless steel mask to achieve a sandwich of destructive thin films of said substrate;

vacuum depositing a thin film of electrical insulating material over said destructive thin film sandwich through a metal mask;

vacuum depositing a thin film of nichrome through a metal mask over said insulating film and photo-etching a circuit pattern therein;

vacuum depositing aluminum and nichrome connector pads to said aluminum and nichrome thin film layers through metal masks, respectively; and

vacuum depositing leads of Kovar and gold wire to said pads adapted for connecting a pulsed voltage to said aluminum of said destructive film and a circuit to said nichrome film

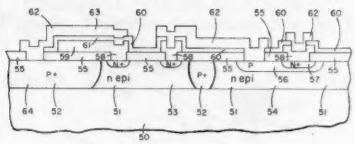
whereby a destructive thin film circuit module is produced.

3,860,836

STABILIZATION OF EMITTER FOLLOWERS

Richard A. Pedersen, Allentown, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 1, 1972, Ser. No. 311,050
Int. Cl. H01l *19/00*
U.S. Cl. 307—303 **12 Claims**



1. A stabilized emitter follower circuit capable of processing input signals containing high frequency components for intergrated circuits having an input terminal pad, said stabilized emitter follower circuit comprising:

an input transistor having a collector, a base and an emitter, said input transistor operated as an emitter follower having an effective primary load impedance provided between said emitter and a source connection means adapted for connection to a voltage source, and

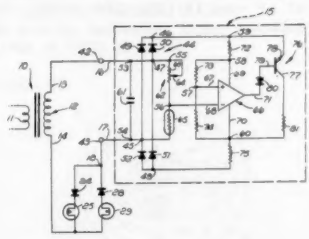
a stabilizing circuit consisting of a stabilizing resistance in series with a stabilizing capacitance, said stabilizing circuit effectively in parallel across said base, said emitter and said effective primary load impedance, there being a direct connection provided between said input terminal pad and said stabilizing circuit.

3,860,837

COMFORT CONTROL SYSTEM AND COMPONENTS THEREOF

Elmer A. Carlson, Agoura, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 345,899, March 29, 1973, Pat. No. 3,815,668. This application Feb. 4, 1974, Ser. No. 438,999
Int. Cl. H03k *17/00*
U.S. Cl. 307—310 **7 Claims**



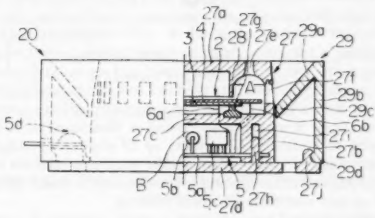
1. An electrical operator comprising: first and second main leads; a full wave bridge rectifier having first, second, third and fourth diodes, and first, second, third and fourth junctions, said first diode being connected from said first junction to said second junction and poled to be conductive toward said second junction, said second diode being connected between said third and second junctions and being poled to be conductive toward said second junction, said third diode being connected from said fourth junction to said third junction and being poled to be conductive toward said third junction, said fourth diode being connected between said fourth and first junctions and being poled to be conductive toward said first junction, said first and second main leads being connected to one of said first and third junctions, respectively; first and second internal leads; fifth, sixth, seventh, eighth and ninth junctions, said first internal lead being connected to one of said second and fourth junctions, said second internal lead being connected to the other of said second and fourth junctions; a differential amplifier having inverting and noninverting signal input leads, first and second power leads, and an output lead, said output lead being connected to said eighth junction, said first internal lead being connected to said eighth junction, said seventh and eighth junctions being connected together, said second internal lead being connected to said ninth junction; first, second, third and fourth resistors, said first resistor being connected from one of said first and third junctions to said fifth junction, said second resistor being connected from the other of said first and third junctions to said fifth junction, one of said first and second resistors being variable, the other of said first and second resistors having a resistance which changes with a predetermined variable, said fifth junction being connected to one of said amplifier signal input leads, said third resistor being connected between said sixth and seventh junctions, said fourth resistor being connected between said sixth and ninth junctions, said sixth junction being connected to the other of said amplifier signal input leads, said first and second power leads of said amplifier being connected to said seventh and ninth junctions, respectively.

3,860,838

PIEZOELECTRIC BUZZER ASSEMBLY

Osamu Kumon, Itami, Japan, assignor to Sumitomi Electric Industries, Ltd., Osaka, Japan

Filed June 21, 1973, Ser. No. 372,079
Claims priority, application Japan, June 26, 1972, 47-74484
Int. Cl. H01v *7/00*
U.S. Cl. 310—8.5 **6 Claims**



1. A piezoelectric buzzer assembly which comprises acoustic means comprising a vibrator including a piezoelectric element and a vibratile disc integrally connected therewith, a casing having an end wall and a cylindrical side wall, the vibrator being arranged in the casing, an electric oscillation circuit electrically connected to the vibrator, and a horn member disposed about the periphery of the casing and flaring radially outwardly thereof, the buzzer assembly comprising the improvement of combining

1. a resonant cylinder integral with the end wall and extending into the casing,

a. the cylindrical side wall and the resonant cylinder defining an annular chamber in the casing surrounding the resonant cylinder, and

b. the end wall and cylindrical side wall defining openings communicating with the annular casing chamber, and

2. the horn member having a diameter reducing from a first end remote from the acoustic means to a second end adjacent thereto,

a. the horn member defining an acoustical chamber with the cylindrical side wall and the openings in the side wall communicating with the acoustical chamber.

3,860,839

ELECTRODYNAMIC TRAVELLING FIELD LINEAR MOTOR OF THE SYNCHRONOUS TYPE

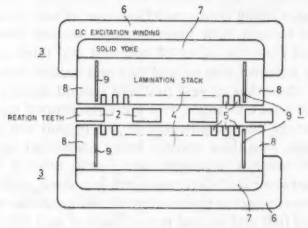
Hubert Buchberger, and Reinmar Hussel, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 7, 1973, Ser. No. 386,424

Claims priority, application Germany, Aug. 15, 1972, 2240704

Int. Cl. H02k *41/02*

U.S. Cl. 310—12 **8 Claims**



1. An electrodynamic travelling field linear motor of synchronous construction comprising: a primary and a secondary arranged with respect to each other for generating a relative thrust movement therebetween in at least one of two mutually opposite directions; said primary comprising an inductor assembly including a lamination stack of metal laminations adjacent said secondary, said lamination stack having respective end-faces directed in corresponding ones of said directions, one of said end-faces being a leading end-face in the one direction of said thrust movement, and a yoke mounted at said leading endface; direct-current excitation means arranged on said inductor assembly for generating the machine field of the motor and for exciting said yoke; and, a multi-phase alternating-current winding mounted in said lamination stack for generating a travelling field, said alternating-current winding having a determined pole-pitch; and, said secondary including solid magnetic sections arranged in a row one behind the other so as to define between each two mutually adjacent ones of said sections a space constituting a nonmagnetic section whereby said secondary is made up of alternately magnetic and nonmagnetic sections, said solid magnetic sections being at a center-to-center spacing corresponding to twice the pole pitch of said alternating-current winding.

3,860,840

LINEAR MOTOR WITH MULTI-SECTION ARMATURE AND A DRIVE DEVICE UTILIZING A LINEAR MOTOR OF THIS KIND

Joseph Laronze, Tassin La Demi-Lune, France, assignor to Brown Boveri & Company Limited, Bader, Switzerland

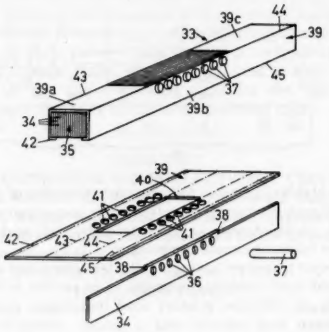
Filed July 17, 1973, Ser. No. 379,946

Claims priority, application France, July 31, 1972, 72.27585

Int. Cl. H02k *41/02*; **B60m** *1/30*

U.S. Cl. 310—13 **19 Claims**

1. An electrical linear motor comprising an inductor component including thereon a series of first winding means energizable with alternating current and a series of second winding means thereon and which are energizable with direct current, an elongated armature component supported for longitudinal movement relative to said inductor component, one of said components being stationary and the other being connectible to an object to be moved from standstill along a prescribed path from one position to another, said armature component comprising three successive armature portions constituted by two portions having a high electrical resistance characteristic longitudinally separated by an intermediate portion having a low electrical resistance characteristic, said inductor component being located opposite one of the high resistance portions of said armature when the object is at standstill, said series of first winding means on said inductor component when energized with alternating current serving to effect a starting movement of the object-connected component of the motor, a proximity detector associated with said armature component



and which produces a signal when the other high resistance portion of said armature and said inductor component come into proximity with each other, and switch means controlled by the signal produced by said proximity detector for effecting energization of said series of second winding means on said inductor component with direct current thereby to reduce the speed of said object-connected component of the motor.

3,860,841

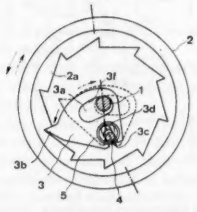
ARRESTER DEVICE FOR SMALL SELF-STARTING SYNCHRONOUS MOTORS

Jean Jullien-Davin, Valence, France, assignor to Crouzet, Paris, France

Continuation of Ser. No. 200,774, Nov. 22, 1971, abandoned. This application Aug. 1, 1973, Ser. No. 384,580

Int. Cl. H02k *7/10*

U.S. Cl. 310—41 **3 Claims**



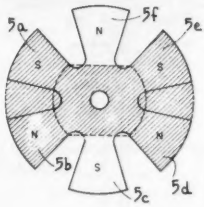
1. An arrester device, particularly for small, self-starting single phase synchronous motors of the type provided with a stator and a rotor having an axis integral therewith, the device including a rigid cam, a fixed axis integral with the stator, said fixed axis being parallel to the axis of the rotor, stop teeth on the rotor, said cam being pivoted to the fixed axis and having a stop finger which, according to the position of the cam, is positioned in the path of the stop teeth for blocking rotation of the rotor or in a position out of the path of movement of the stop teeth, said cam being provided with a closed elongated

aperture, and elastic means urging the cam in frictional contact with the rotor axis along the edge of the closed aperture.

3,860,842
ELECTROMAGNETIC ROTATIVE STEP BY STEP MOTOR

Michel Schwab, Bienne, and Pierre-Andre Meister, Ipsach, both of Switzerland, assignors to Societe Suisse pour L'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Filed Nov. 23, 1973, Ser. No. 418,740
Claims priority, application Switzerland, Nov. 30, 1972, 17503/72
Int. Cl. H02k *37/00*
U.S. Cl. 310—49 **1 Claim**

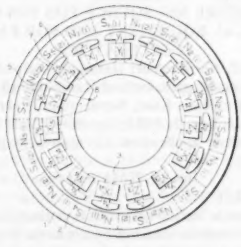


1. A rotative electromagnetic step by step motor, energized by successive pulses of opposite polarity, comprising a rotor having alternating magnetic poles, a plurality of pairs of pole shoes, each pair defining an air gap, the number of pairs of pole shoes being equal to 2^n, n being at least 1, and the number of the magnetic poles of the motor being equal to 3×2^n, the pole shoes being arranged such that the number of magnetic poles of the rotor present in the air gaps, at the stable rest positions of the motor, is equal to 2×2^n.

3,860,843
ROTATING ELECTRIC MACHINE WITH REDUCED COGGING

Itaru Kawasaki; Kazutsugu Kobayashi, and Yoshiaki Igarashi, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 154,450, June 18, 1971, abandoned. This application Mar. 22, 1973, Ser. No. 343,673
Claims priority, application Japan, June 26, 1970, 45-56347; June 26, 1970, 45-56350
Int. Cl. H02k *21/22*
U.S. Cl. 310—67 **7 Claims**

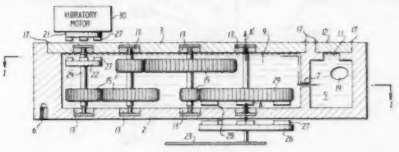


1. A rotating electric machine comprising a rotor having a permanent magnet with a plurality of poles therearound, a stator core having a plurality of salient poles therearound, and a plurality of stator coils, each of which is wound on each of said salient poles and connected to each other so as to form a stator winding having a plurality of phases, wherein said stator winding has $(2n+1)$ phases, and said permanent magnet having a number of poles in a ratio of $(2n+2)/(2n+1)$ to the number of said salient poles, and each of said stator salient poles belonging to one phase being magnetically positioned at the same position as that of the corresponding pole of said rotor.

3,860,844
LOW FRICTION MINIATURE GEAR DRIVE FOR TRANSMITTING SMALL FORCES

Max Hetzel, Biel, Switzerland, assignor to Societe Suisse pour L'Industrie Horlogere Management Services SA, Stampfli, Switzerland

Division of Ser. No. 322,381, Jan. 10, 1973,. This application Nov. 6, 1973, Ser. No. 413,242
Int. Cl. H02k *49/10*
U.S. Cl. 310—104 **11 Claims**

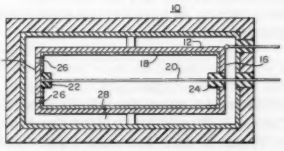


1. A low friction miniature gear drive for transmitting small forces said gear drive comprising:
a housing having a gear train chamber;
a gear train disposed within said chamber;
a liquid within said chamber completely immersing said gear train;
means closing said chamber;
magnetic means for transmitting power to and from said gear train through the wall of said housing;
an expansion chamber in said housing; and,
a channel connecting said expansion chamber to said gear train chamber;
said liquid completely filling said gear train chamber and filling said expansion chamber except for a small air bubble therein;
and means closing said expansion chamber.

3,860,845
LONG LIFE PROPORTIONAL COUNTER RADIATION DETECTOR

Charles H. Gleason; Allan J. Bamford, and Wallace Gillies, all of Horseheads, N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 27, 1973, Ser. No. 374,228
Int. Cl. H01j *39/32*
U.S. Cl. 313—61 D **8 Claims**



1. A radiation detector comprising a discharge confining envelope having a neutron absorptive material deposited on the interior surface thereof, a centralized conductive member supported within said discharge confining envelope with at least one end of the conductive member brought through said envelope, a fill gas within said disharge confining envelope at

least a portion of which is dissociable gas which is dissociable upon exposure to radiation emitted by the neutron-absorptive material, and a fill gas reservoir interconnected with the said discharge confining envelope but substantially shielded therefrom, to prevent exposure of the fill gas contained within the reservoir to radiation emitted by the neutron absorptive material.

3,860,846

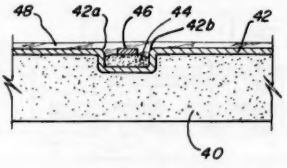
PLANAR PLASMA DISCHARGE DISPLAY PANEL

William N. Mayer, White Bear Lake, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 292,598, Sept. 27, 1972, abandoned. This application Feb. 22, 1974, Ser. No. 444,634

Int. Cl. H01j *61/30*

U.S. Cl. 313—491 **2 Claims**



1. A plasma discharge display panel comprising:

an electrically non-conducting substrate, said substrate being contoured to have a plurality of parallel channels therein;

a first group of electrical conductors secured to said substrate in orthogonal relationship to said channels and conformed to the contour thereof and in generally parallel relation to one another and, further, said conductors being adapted to be connected with a source of drive voltage for the panel;

a first layer of electrically non-conducting dielectric material secured to said substrate in overlying relation to said electrical conductors to form an electrically non-conducting generally planar surface;

a second group of electrical conductors secured to said surface, each of said conductors in generally overlying relation to one of said channels, so that the conductors of said second group are in crossing relation to the conductors of said first group, said substrate having at least one shoulder for each conductor of said first group in relation to each of said channels to define discharge areas on said panel between said shoulders of said conductors of the first group and related conductors of said second group, the conductors of said second group being adapted to be connected with a source of drive voltage for the panel;

a second layer of electrically non-conducting dielectric material secured to said first layer in overlying relation to said second group of electrical conductors forming an electrically non-conducting surface; and,

means for confining an ionizable gaseous atmosphere over said second layer of dielectric material.

3,860,847

HERMETICALLY SEALED SOLID STATE LAMP

James A. Carley, Rolling Hills, Calif., assignor to Los Angeles Miniature Products, Inc., Torrance, Calif.

Filed Apr. 17, 1973, Ser. No. 352,006

Int. Cl. H01k *1/30*

U.S. Cl. 313—110 **3 Claims**

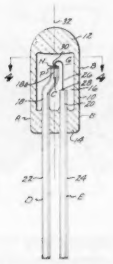
1. A solid state lamp of the type that includes a light emitting diode having a *p* region and an *n* region and said lamp being characterized by an assembly that concurrently acts as a heat sink and protector for said diode, said assembly comprising:

a. a rigid glass envelope having a side wall in the form of a surface of revolution and first and second ends, said first end capable of transmitting light therethrough;

b. first means for hermetically sealing said second end of said envelope, said first means and envelope cooperating to define a confined space within the interior of the latter;

c. an inert heat conducting gas situated in said confined space;

d. first and second laterally spaced elongate electrical conducting members that have intermediate portions thereof hermetically sealed in said first means, with said members having first portions thereof situated in said confined space, and said members having second portions thereof projecting outwardly from said first means and connectable to a source of electric power, with said first portion



of said first member supporting said diode in a fixed position in said confined space in such a manner that said *p* region of said diode is in electrical communication with said first portion, and said diode aligned with the longitudinal axis of said envelope; and

e. second means for maintaining electrical communication between said *n* region and first portion of said second conductor to cause said diode to luminesce when an electric current is applied to said second portions of said first and second members in a forwardly biased direction, said envelope preventing said diode being damaged by forceful contact with a hard object, and said gas due to said diode being centered in said envelope conducting heat from all parts of said diode at an equal rate during the operation of said lamp to minimize said diode being subjected to thermal strains.

3,860,848

HIGH PRESSURE ION SOURCE FOR ION OPTICAL ANALYTICAL EQUIPMENT AND FOR PARTICLE ACCELERATORS

Hans Kurt Knof, Norderstedt; Hermann Dietrich Krafft, and Volker Wilhelm Hausen, both of Hamburg, all of Germany, assignors to Dr. Hans Knof, Norderstedt, Germany

Filed Aug. 2, 1972, Ser. No. 277,310

Claims priority, application Germany, Aug. 31, 1971, 2143460

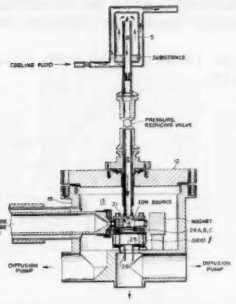
Int. Cl. H01j *39/34*

U.S. Cl. 313—231 **5 Claims**

1. An ion source having an ionization chamber coupled to a gas inlet tube and surrounded by a source chamber having an ion exit port, a plurality of horizontally extending accelerating electrodes positioned adjacent the ionization chamber, between the ionization chamber and the ion exit port in the source chamber, and an electron gun communicating with the ionization chamber, wherein the improvement comprises:

a grid positioned within the source chamber and extending vertically from said accelerating electrodes toward the

ion exit port in the source chamber to define an ion exit path for screening the ions from the source chamber, said



grid being maintained at about the same potential as the ionization chamber.

3,860,849

CHANNEL PLATE WITH COLOR SELECTION ELECTRODES AND COLOR PHOSPHORS

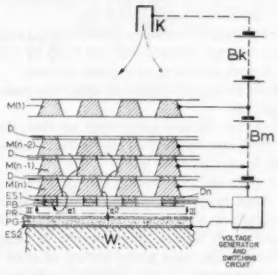
Pieter Schagen; Hewson Nicholas Graham King, and Derek Washington, all of Salfords, England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 13, 1972, Ser. No. 288,597

Claims priority, application Great Britain, Aug. 8, 1972, 42723/72

Int. Cl. H01j *29/08, 29/32*

U.S. Cl. 313—400 **2 Claims**



1. An image display screen for use in a color television tube, comprising;

a channel plate defining a display area and having an input side for receiving electrons from a scanning electron beam and an output side for delivering electrons from channels in said channel plate;

a first color selection electrode insulated from and covering at least a portion of the output side of said channel plate but shaped so as to not block the channels of said channel plate;

a first phosphor layer corresponding to a first color substantially covering the side of said first color selecting electrode remote from said channel plate;

a second color selection electrode coextensive with said channel plate and spaced from and facing said first color phosphor; and

a second phosphor layer corresponding to a second color substantially covering the side of said second color selection electrode on the side thereof facing said first color phosphor layer, whereby electrons delivered from said channel plate may be directed to either said first or second phosphor layers by application of appropriate electrical potentials to said first and second color selection electrodes.

3,860,850

COLOR CATHODE RAY TUBE WITH COLOR RASTER DISPLACEMENT CORRECTION

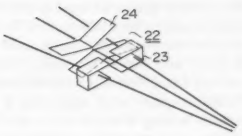
Shigeo Takenaka; Kazuhiko Idaka, and Yuichi Sakamoto, all of Fukaya, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed May 15, 1972, Ser. No. 253,212

Claims priority, application Japan, May 18, 1971, 46-32975

Int. Cl. H01j *29/62, 29/72*

U.S. Cl. 313—428 **9 Claims**



1. A color cathode ray tube comprising:

an envelope including a neck portion, a conical portion and a face plate;

a fluorescent screen formed on the inner surface of said face plate;

a shadow mask disposed close to said fluorescent screen;

electron gun means for projecting a central electron beam and a pair of side electron beams, said beams being disposed in the same plane and being directed toward said fluorescent screen through horizontal and vertical deflection fields produced by an electromagnetic deflection yoke device; and

electron beam control means for equalizing the sizes of the rasters produced by said electron beams on the screen, said electron beam control means being disposed adjacent the path of said electron beams and in the region of the horizontal and vertical deflection field between said electron gun means and said deflection yoke so as to cooperate with said deflection yoke to modify the flux distributions, and including:

a first control member including a pair of similarly shaped control elements of high magnetic permeability around respective side beams along a given length of travel of the side beams, said control elements shielding the side beams from both horizontal and vertical deflection fields to reduce both horizontal and vertical deflection flux acting on the side beams as compared with that acting on the central beam; and

a second control member including a pair of control elements of high magnetic permeability and symmetrically located equidistantly above and below the plane of the beams and symmetrical with the first control elements, the elements of said second control member both being similarly shaped, said second control member being located to modify the flux distribution in the region of the central beam so as to enhance the horizontal deflection flux acting on the central beam as compared with that acting on the side beams and to modify the flux distribution in the region of the central beam so as to reduce the vertical deflection flux acting on the central beams as compared with that acting on the side beams.

3,860,851

GAUZE ELECTRODE FOR A CATHODE-RAY TUBE

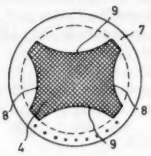
Willem Antonius Maria Hamersma, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 9, 1973, Ser. No. 404,340

Claims priority, application Netherlands, Oct. 27, 1972, 7214547

Int. Cl. H01j *29/46*

U.S. Cl. 313—456 5 Claims



1. In a cathode-ray tube having a target electrode at one end of an envelope and a gauze electrode spaced from said target electrode, the improvement comprising at least one annular member spaced from said target for supporting said gauze electrode with reduced microphonic interference, said annular member having an inner edge enclosing a substantially rectangular aperture having at least two oppositely located curved sides, said gauze electrode comprising wires extending substantially parallel to the diagonals of said rectangular apertures.

3,860,852

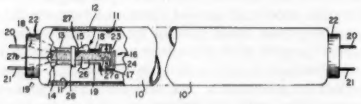
FLUORESCENT LAMP CONTAINING AMALGAM-FORMING MATERIAL

Frank M. Latassa, Magnolia; Howard W. Milke, Danvers, and Tadius T. Sadoski, Salem, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Apr. 4, 1974, Ser. No. 457,927

Int. Cl. H01j *61/24*

U.S. Cl. 313—490 14 Claims



1. A low-pressure mercury vapor discharge lamp comprising:

an hermetically sealed, elongated light-transmitting envelope containing an inert ionizable fill gas and a quantity of mercury,

a mount structure including a stem sealed to and extending inwardly from each end of said envelope and an electrode supported at the inward end of each of said stems,

at least one of said mount structures having attached thereto an elongated carrier extending from the electrode region thereof toward the opposite end of the stem thereof, and

an amalgam-forming material contained on said carrier, a first region of said amalgam-forming material being located at the end of said carrier near said electrode to thereby have a higher operating temperature for facilitating starting of said lamp, and a second region of said amalgam-forming material being located at the opposite end of said carrier to thereby have a lower operating temperature than said first region for regulating the mercury vapor pressure of said lamp during operation.

3,860,853

FLASH LAMP SYSTEM

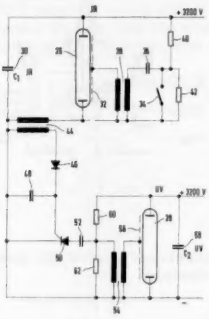
Wolfgang Ludloff, Porz-Westhoven, Germany, assignor to Multiblitz Dr.-Ing. D. A. Mannesman GmbH & Co. KG, Porz-Westhoven, Germany

Filed May 3, 1973, Ser. No. 357,001

Claims priority, application Germany, May 6, 1972, 2222365

Int. Cl. H01j *61/30;* H05b *41/14*

U.S. Cl. 315—178 13 Claims



1. In a flash lamp apparatus comprising a flash tube filled with gas under pressure, a supply storage capacitor means, means to apply an operating voltage to said storage capacitor means, a discharge circuit including said flash tube and said supply capacitor means and having a resistance so low that the peak current of the discharge is defined substantially only by the flash tube, the improvement comprising:

said pressure of the gas in said tube being above 600 millimeters of mercury,

said tube having a discharge gap of a length such that the ratio of said length to said operating voltage is no greater than 0.5 centimeters per 100 volts,

said capacitor means having a capacitance such that, after firing, the voltage thereof will not drop by more than 15 percent before reaching said peak current,

said flash tube being positioned to apply the radiation therefrom to a surface,

infrared radiator means positioned so that the radiation therefrom is also applied to said surface along with said radiation from said flash tube,

said radiator means comprising circuit means including a second flash tube, and means connecting said second circuit means to said first circuit means to fire the first mentioned flash tube a given period of time after said second flash tube, said given period of time being such that the maximums of the infrared radiation from said second flash tube coincides with the ultraviolet radiation from the first mentioned flash tube, and

means connected to said radiator means for varying the intensity of the infrared radiation.

3,860,854

METHOD FOR USING METALLIC HALIDES FOR LIGHT PRODUCTION IN ELECTRODELESS LAMPS

Donald D. Hollister, 2031 Tweed St., Placentia, Calif. 92670

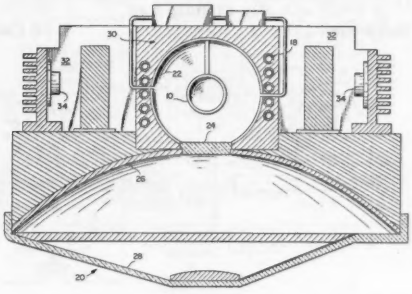
Continuation-in-part of Ser. No. 218,496, Jan. 17, 1972, Pat. No. 3,763,392. This application Sept. 17, 1973, Ser. No. 398,108The portion of the term of this patent subsequent to Oct. 2, 1990, has been disclaimed.

Int. Cl. H01j *61/12;* H05b *41/24*

U.S. Cl. 315—248 14 Claims

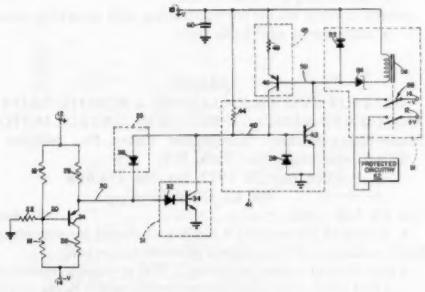
1. Method for producing an electrodeless plasma arc as a high intensity reflected light source comprising:

A. confining a plasma-forming gas within an electrodeless container;
B. pressurizing said plasma forming gas to at least one atmosphere;
C. generating radio-frequency electromagnetic power in an inductor/reflector device positioned exteriorly of said container, so as to develop magnetically an induction



field extending through said container and into said gas, such that said gas is ionized as a plasma arc suspended within said container independently of the walls of said container, and
D. further including pressurizing said gas, limiting frequency and magnitude of said induction field, so that the discharge of said plasma arc is of lesser than the diameter of said container.

3,860,855
MULTIPLE VOLTAGE SOURCE IMBALANCE DETECTION AND PROTECTION CIRCUIT
Robert L. Caswell, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Dec. 7, 1973, Ser. No. 422,624
Int. Cl. H02h *3/28*
U.S. Cl. 317—27 R **9 Claims**

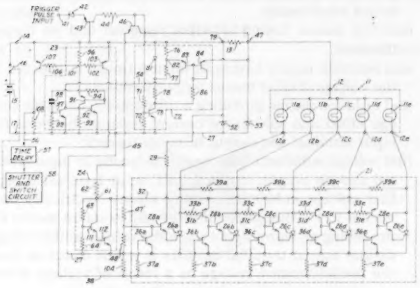


1. A voltage imbalance detection and protection circuit for monitoring the operation of first and second voltage sources which produce voltages which have a predetermined relationship, wherein said imbalance detection and protection circuit monitors the operation of the voltage sources to detect voltage imbalance which would be harmful to protected circuitry operating from the voltage sources and disconnects the protected circuitry from the voltage sources before it is damaged by such voltage imbalances, said detection and protection circuit comprising:
voltage divider means having first and second input terminals and an output terminal;
said voltage divider means having its first input terminal electrically connected to a first monitored voltage source and its second input terminal electrically connected to a second monitored voltage source;
said voltage divider means providing a predetermined voltage at voltage divider output terminal when the voltages provided by said voltage sources have their predetermined relationship;
isolation means having an input terminal and an output terminal;
said isolation means having its input terminal connected to the voltage divider means output terminal;
said isolation means providing a substantially constant voltage offset and substantial current isolation between the input terminal and output terminal thereof;
first voltage imbalance sensing means having an input terminal and an output terminal, said input terminal of said first voltage imbalance sensing means electrically connected to the output terminal of said isolation means for producing an alarm signal when the voltage at the voltage divider output terminal deviates in a first direction from the predetermined voltage as a result of voltage imbalance between said monitored voltage sources;
second voltage imbalance sensing means having an input terminal, and an output terminal, said input terminal of said second voltage imbalance sensing means electrically connected to the output terminal of said isolation means for producing an alarm signal when the voltage at the voltage divider output terminal deviates in a second direction from said predetermined voltage as a result of a voltage imbalance between said monitored voltage sources;
output logic switching means connected to the output terminal of said first voltage imbalance sensing means and to the output terminal of said second voltage imbalance sensing means, said output logic switching means providing a first type of control signal when neither of said first and second voltage imbalance sensing means provides an alarm signal, and a second type of control signal when either said first or said second voltage imbalance sensing means produces an alarm signal;
circuit protection means having normal and abnormal states;
said circuit protection means in its normal state providing a continuous electrical circuit connecting the monitored voltage sources to the protected circuitry and in its abnormal state interrupting the electrical circuit connection between the monitored voltage sources and the protected circuitry, and;
said circuit protection means switching to its abnormal condition only upon receipt of a second type control signal from said output logic switching means and remaining in said abnormal condition until a first control signal is received from said output logic switching means.

3,860,856
LATCHING CIRCUITRY IN A CIRCUIT FOR SEQUENTIALLY FIRING PHOTOFLASH LAMPS
Donald L. Watrous, Liverpool, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Oct. 24, 1972, Ser. No. 299,651
Int. Cl. F23q *7/02*
U.S. Cl. 317—80 **3 Claims**

1. An improved latch circuit for providing a lock-out signal to a sequencing circuit which sequentially flashes a plurality of flash lamps, said latch circuit being adapted to produce said lock-out signal in response to a latching signal provided by a circuit for sensing current flow to a flashing lamp, wherein the latch circuit comprises a current feed means and a pair of transistors connected together and to said current feed means in a regenerative feedback circuit, electrical means biasing said transistors to be normally nonconductive, electrical means connected to apply said latching signal to said regener-

ative feedback circuit to render said transistors conductive and produce a lock-out signal at said current feed means, said latch circuit being subject to being falsely actuated by spurious transient voltages which may occur in the circuit, and including a transistor switch circuit connected to selectively



disable said regenerative feedback circuit, and a capacitor connected between said switch circuit and a circuit point where said spurious transient voltages are likely to occur, said switch circuit being adapted to momentarily disable said regenerative feedback circuit upon the occurrence of a spurios transient voltage.

3,860,857

ELECTROPHOTOGRAPHIC TRANSFER METHOD

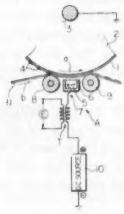
Ryoichi Namiki, and Haruyoshi Kawano, both of Tokyo, Japan, assignors to Ricob Co. Ltd., Tokyo, Japan

Filed Sept. 12, 1972, Ser. No. 288,268

Claims priority, application Japan, Sept. 20, 1971, 46-73136

Int. Cl. G03g *15/00;* **H01t** *19/00*

U.S. Cl. 317—262 A **4 Claims**



1. In an electrophotographic device of the type comprising:

a. a transfer member having a photoconductive surface;

b. means for producing a toner image on said photoconductive surface;

c. means for bringing one surface of a transfer sheet into contact with said toner image on said photoconductive surface at a transfer station; and

d. charging means at said transfer station for creating a corona discharge adjacent the opposite surface of said transfer sheet when brought into contact with said photoconductive surface to facilitate the transfer of said toner image thereto;

wherein the improvement comprises:

e. means for supplying a DC biased AC voltage to said charging means for creating said corona discharge to facilitate the separation of said transfer sheet from said photoconductive surface.

3,860,858

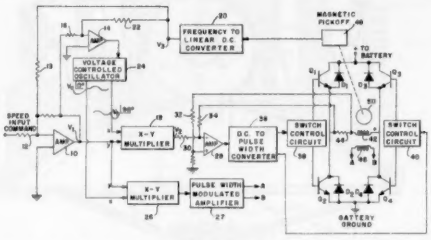
VARIABLE FREQUENCY INVERTER FOR AC INDUCTION MOTORS WITH TORQUE, SPEED AND BRAKING CONTROL

Frank J. Nola, Huntsville, Ala., assignor to The United States of America as represented by the Administration of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 19, 1973, Ser. No. 426,155

Int. Cl. H02p *5/40*

U.S. Cl. 318—227 **6 Claims**



1. A variable frequency inverter for controlling the operation of an AC induction motor powered by a DC source, comprising:

a summing amplifier which provides a DC output which is the sum of at least two DC inputs;

a DC amplifier having a DC speed input command signal applied to its input terminal and having its output signal connected to said summing amplifier to provide one of said inputs;

means responsive to the shaft speed of said motor for generating a DC speed proportional voltage and for applying said voltage to said DC amplifier input terminal and to said summing amplifier to provide another of said inputs;

a voltage controlled oscillator connected to said summing amplifier output to be controlled thereby;

means for multiplying the output of said voltage controlled oscillator with said DC amplifier output signal;

means for receiving the output of said multiplying means and for generating a pulse train in response thereto;

switching means for switchably connecting a winding of said motor to said DC source; and,

switch control means for controlling said switching means in response to said pulse train.

3,860,859

ROTATOR SYSTEM INCLUDING A REMOTE DRIVE MOTOR AND A LOCAL INDICATOR-CONTROL MOTOR

Bruce Harry Buckley, Huntingdon Valley, Pa., assignor to RCA Corporation, New York, N.Y.

Filed July 24, 1972, Ser. No. 274,638

Int. Cl. G05d *3/00*

U.S. Cl. 318—265 **9 Claims**

1. A system for rotating a remote shaft and for providing a local indication of the rotated position comprising:

a first driving means including a first reversible motor and a first drive train, said first reversible motor being responsive to energization potential applied thereto for driving said remote shaft and said first drive train,

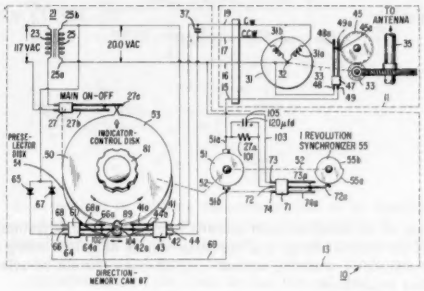
a local movable indicator,

a second driving means including a second reversible motor and a second drive train coupled to each other and said indicator and responsive to an energization potential applied thereto for driving said indicator,

first switching means coupled between a suitable source of potential and said first motor for causing rotation of said shaft and movement of said first drive train,

second switching means including a first cam and a first cam-operated switch driven by said first cam coupled between a suitable source of potential and said second

motor and coupled to said first drive train responsive to a given movement of said first drive train to cause activation and rotation of said second motor and movement of said indicator,



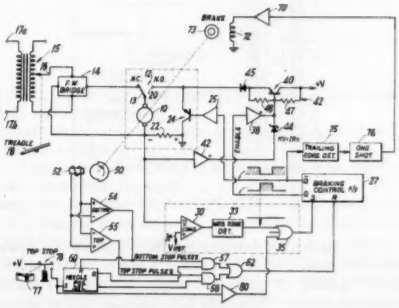
motor control means including a second cam and a second cam-operated switch driven by said second cam coupled to said second drive train for controlling the rotation of said second motor to provide a predetermined movement of said indicator each time said first drive train moves said given amount.

3,860,860

MOTION CONTROL SYSTEM FOR DIRECT CURRENT MOTORS, PARTICULARLY IN SEWING MACHINE USES

Robert J. Moran, Littleton; Constantine J. Pateuk, Billerica, and Larry M. LeBlanc, Natick, all of Mass., assignors to Photocircuits Division of Kollmorgan Corporation, Glen Cove, N.Y.

Filed Apr. 3, 1973, Ser. No. 347,498
Int. Cl. H02r *3/16*
U.S. Cl. 318—375 **23 Claims**



1. A braking control system for a dc motor adapted for energization by an external power source, comprising:

external braking means for applying a retarding force to the motor;

means responsive to the back emf of the motor when the motor is unenergized by the external power source to develop a speed representative signal; and

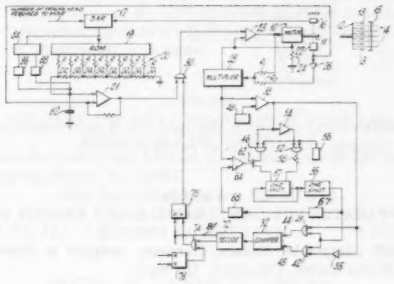
braking control means responsive to the speed representative signal for energizing the external braking means at a time when the motor attains a given speed level.

3,860,861

DISK DRIVE HEAD POSITIONING SERVO INCLUDING TEMPERATURE RESPONSIVE SAFETY MEANS

George C. Gucker, Old Bethpage, N.Y., assignor to Potter Instrument Company, Inc., Plainview, N.Y.

Filed Dec. 27, 1971, Ser. No. 212,450
Int. Cl. H02b *1/00*
U.S. Cl. 318—473 **24 Claims**



1. An improved servo system for moving a transducer among information tracks in response to each of a series of signals commanding the transducer to move to a new track, comprising in combination:

a servo motor connected to said transducer for moving it from track to track;

means for monitoring the temperature of said servo motor; said temperature monitoring means including means for generating an output signal when the temperature of said motor exceeds a predetermined temperature;

means for energizing said motor in a controlled fashion during starting, running and stopping such that said motor temperature exceeds said predetermined temperature in response to at least a certain series of command signals; and

means responsive to said output signal to delay the energization of said motor in response to a command signal until the temperature of said motor drops a predetermined amount.

3,860,862

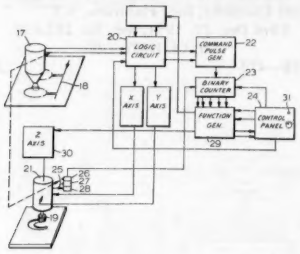
OPTICAL LINE FOLLOWING PROGRAM CONTROL SYSTEM

William Dell, Hamilton, Ontario, and Robert E. Parker, Dundas, Ontario, both of Canada, assignors to Westinghouse Canada Limited, Hamilton, Ontario, Canada

Filed Jan. 31, 1972, Ser. No. 222,105
Claims priority, application Canada, Jan. 29, 1971, 103940
Int. Cl. G05b *19/42*
U.S. Cl. 318—568 **6 Claims**

1. A machine tool control system comprising an optical pattern follower including means to sense a pattern and control the machine tool in accordance with the pattern and to sense command marks on the pattern being followed and produce therefrom first command pulses, means on said machine to sense the condition of the work tool of said machine and produce in response thereto second command pulses representative of said condition and substantially identical to said first command pulses, a control panel and means thereon to control the production of further control pulses substan-

tially identical to said first command pulses, means to count all of said command pulses as they are produced and effect



predetermined changes in the operation of said control system in response to total count of pulses produced.

3,860,863

APPARATUS FOR CONVERTING LIGHT ENERGY INTO ELECTRICAL ENERGY

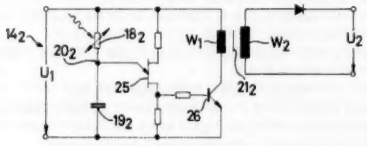
Adolf Lamprecht, Hausen, Germany, assignor to Rowenta-Werke GmbH, Offenbach, Germany

Filed Oct. 12, 1973, Ser. No. 406,032

Claims priority, application Germany, Oct. 28, 1972, 2253039

Int. Cl. H02p *13/18*

U.S. Cl. 321—2 **15 Claims**



1. An apparatus for the conversion of light energy into electrical energy including a photoelectric transducer capable of generating electrical energy when exposed to visible or other light radiation, an electrical storage device connected to said photoelectric transducer for storing energy generated thereby, a direct current transformer connected to receive electrical energy derived from said photoelectric transducer and stored in said electrical storage device, said direct current transformer being adapted to convert the direct voltage output of said photoelectric transducer into an alternating or intermittent voltage, and a photosensitive device in circuit with said direct current transformer so as, in operation, to control the frequency of said alternating or intermittent voltage in dependence upon the level of illumination of said photoelectric transducer.

3,860,864

POWER SUPPLY CIRCUITS

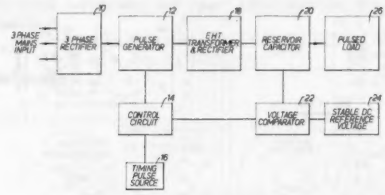
Philip John Fitz, Great Baddow, England, assignor to The Marconi Company Limited, Essex, England

Filed Sept. 17, 1973, Ser. No. 397,623

Int. Cl. H02m *5/00*

U.S. Cl. 321—18 **4 Claims**

1. A power supply circuit for feeding a steady d.c. voltage to a load, comprising charge storage means, pulse generator means for supplying charging current pulses to the charge storage means and level detector means operative to inhibit the further supply of charging pulses to the charge storage means when the stored charge attains a predetermined level; the pulse generator means comprising two sources of charging pulses; the charge storage means being a pulse forming network; and the level detector means including two circuits each sensitive to the stored charge attaining a respective predetermined level, one source of pulses acting in conjunction with



one of the level detector circuits to effect coarse adjustment of the stored charge and the other source of pulses acting in conjunction with the second level detector circuit to effect fine adjustment.

3,860,865

SELECTIVE FIRING INDICATOR AND RECORDING

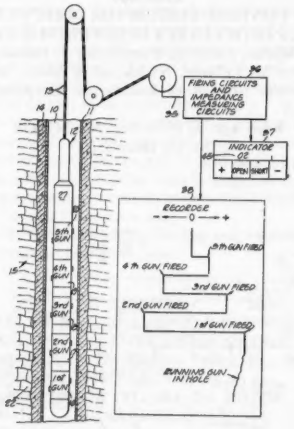
Stanley G. Stroud, and James D. Estes, both of Houston, Tex., assignors to N L Industries, New York, N.Y.

Division of Ser. No. 277,408, Aug. 2, 1972, Pat. No. 3,773,120.

This application Sept. 21, 1973, Ser. No. 399,310

Int. Cl. G01r *31/02*

U.S. Cl. 324—51 **6 Claims**

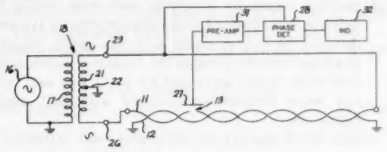


1. The method of determining the condition of a down-hole electrical circuit containing a series of actuatable elements capable of being terminally actuated by successive electrical pulses of relatively high intensity and of alternating polarity and in which said actuating pulse bypasses the not yet actuated elements through bypassing resistors each of which is switched out of said circuit only as its corresponding element becomes actuated and so as to reach the next element in line to be actuated and said series of actuatable elements and bypassing resistors presenting an impedance of said circuit which comprises passing a series of measuring pulses through said circuit of alternating polarity at times other than during said actuating pulses, and causing the impedances measured by said measuring pulses of alternating polarity to operate an indicating display responsive both to impedance and polarity, said measuring pulses having an intensity insufficient to actuate said actuatable elements.

3,860,866
METHODS AND APPARATUS FOR LOCATING AN OPEN SECTION IN A CONDUCTOR

George Christian Ernst Dornberger, Phoenix, Ariz., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed May 4, 1973, Ser. No. 357,129
Int. Cl. G01r *31/08*
U.S. Cl. 324—52 15 Claims



1. A method of locating an open section of an insulated elongated conductor which comprises the steps of:

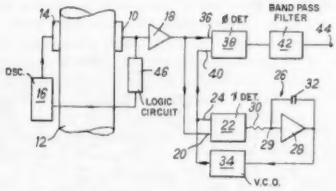
simultaneously applying first and second periodic phase-shifted electrical signals to the elongated conductor on opposite sides of the open section thereof; and

detecting a phase shift along the elongated conductor to locate the open section thereof.

3,860,867
CIRCUITS FOR DETECTING RAPID FLUCTUATIONS IN THE PHASE OF AN A.C. SIGNAL

Peter Alan Johnson, Caddington, England, assignor to George Kent Limited, Bedfordshire, England

Filed July 19, 1973, Ser. No. 381,680
Claims priority, application Great Britain, July 21, 1972, 34237/72
Int. Cl. G01r *25/00*
U.S. Cl. 324—83 R 7 Claims



1. A circuit for detecting rapid fluctuations in the phase of an A.C. signal comprising:

an input terminal to which the A.C. signal is applied and an output terminal,

a first phase detector having first and second input terminals and an output terminal;

means for applying the A.C. signal, the phase fluctuations of which are to be detected, to said first input terminal of said first phase detector;

a controlled oscillator having a control input terminal and an output terminal, said controlled oscillator generating a signal on said output terminal responsive to a signal on said control terminal;

means for connecting said signal on said output terminal of said controlled oscillator to said second input terminal of said first phase detector;

said first phase detector providing an output signal on said output terminal of said first phase detector dependent upon the difference in phase between the A.C. signal applied to said first input terminal of said first phase detector and said signal applied to said second input terminal of said first phase detector;

low pass filter means with an input terminal, electrically connected to said output terminal of said first phase detector, and an output terminal electrically connected to said control input terminal of said controlled oscillator, for passing said first phase detector output signal to said control terminal of said controlled oscillator, such that, said controlled oscillator is held by negative feedback at a frequency equal to the mean frequency of the A.C. signal;

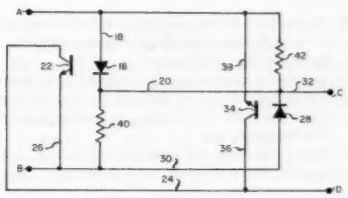
said low pass filter means being operative to prevent changes in said output of said first phase detector occurring at frequencies above a predetermined value from being passed from said output terminal of said first phase detector to said control terminal of said controlled oscillator;

means for comparing the phase of the A.C. signal with said signal generated by said controlled oscillator to thereby generate a signal dependent solely on rapid fluctuations in phase of the A.C. signal.

3,860,868
VOLTAGE POLARITY SENSOR INDICATOR AND DIRECTOR CIRCUIT DEVICE

Joseph S. Lindell, and Richard G. Noullett, both of 104 Summit St., Butler, Pa. 16001

Filed Sept. 26, 1973, Ser. No. 400,932
Int. Cl. G01r *19/14*
U.S. Cl. 324—133 5 Claims



1. A voltage polarity sensor indicator and director circuit device which comprises:

a. a pair of input terminals A and B;

b. a pair of output terminals C and D;

c. a first light-emitting infrared diode having an anode and cathode and a corresponding first photosensitive transistor with a collector and emitter, means coupling the anode to input terminal A, means coupling the cathode to output terminal C, means coupling the emitter to input terminal B and means coupling the collector to output terminal D; and

d. a second light-emitting infrared diode having an anode and cathode and a corresponding second photosensitive transistor with a collector and emitter, means coupling the anode to input terminal B, means coupling the cathode to output terminal C, means coupling the emitter to input terminal A and means coupling the collector to output terminal D.

3,860,869
DEVICE FOR MEASURING VEHICLE SPEED BY MEASURING DISTURBANCE OF THE EARTH'S MAGNETIC FIELD

Jack G. Parks, Troy, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 29, 1974, Ser. No. 437,565
Int. Cl. G01p *15/00*
U.S. Cl. 324—163 8 Claims

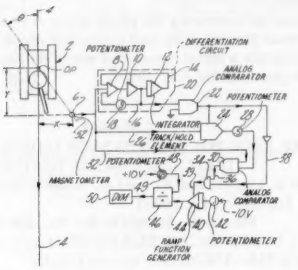
1. A device to measure the velocity of a vehicle along a given path comprising:

a. a single magnetometer positioned at a predetermined distance from the path for detecting the vehicle-induced disturbance of the geomagnetic field; and

b. an electronic circuit connected to receive the output of the magnetometer and having

i. means for continuously monitoring the magnetometer's output, for sensing the maximum output, and for calculating the occurrence of two predetermined amplitudes of the magnetometer's output on the basis of said maximum,

ii. means for determining the elapsed time between the two amplitudes,



iii. means for relating said two predetermined amplitudes to the distance the vehicle moves along the path between the two amplitudes,

iv. means for correlating said elapsed time data and said output amplitudes in relation to the distance moved along the path to produce an output proportional to vehicle speed, and

v. means receiving said proportional output and presenting it in terms of speed intelligence.

3,860,870

MICROWAVE RELAY SYSTEM HAVING AUXILIARY SIGNAL TRANSMISSION ARRANGEMENT

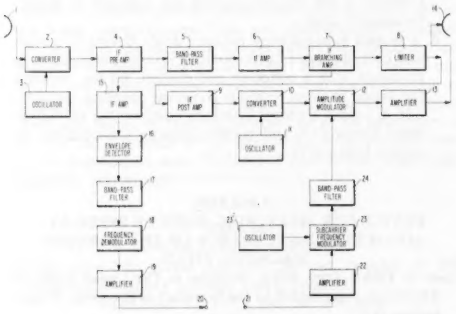
Tadashi Furuya, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Jan. 9, 1974, Ser. No. 432,113

Claims priority, application Japan, Jan. 12, 1973, 48-6723

Int. Cl. H04b *7/16*

U.S. Cl. 325—3 **4 Claims**



1. A microwave heterodyne relay system having a plurality of relay stations each having a transmitting and receiving means for relaying a main carrier wave angle-modulated with a main base band signal, said transmitting and receiving means in at least one relay station including an auxiliary signal transmission means comprising:

transmitting means for said auxiliary signal consisting of:

means for generating a subcarrier wave so selected as to be disposed outside the uppermost component of said base band,

means for frequency-modulating said subcarrier wave with an auxiliary signal, and

means for amplitude-modulating said main carrier wave with said frequency-modulated subcarrier wave;

receiving means for said auxiliary signal consisting of:

branching means for receiving said main carrier wave amplitude-modulated with said subcarrier wave and for dividing its output signal into two paths, means for envelope-detecting one of the branched components of said main carrier wave and for extracting said subcarrier wave frequency-modulated with said auxiliary signal, and

means for frequency-discriminating said extracted subcarrier wave so as to demodulate said auxiliary signal; and

amplitude limiting means consisting of:

means for receiving the other of said branched components of the main carrier wave and for suppressing amplitude variation of said received amplitude-modulated main carrier wave, and

means for applying said amplitude-limited main carrier wave to the input of said amplitude-modulating means.

3,860,871

PHASE CONTROL SYSTEM FOR DEMODULATION CARRIER IN CARRIER BAND MULTILEVEL SIGNAL TRANSMISSION

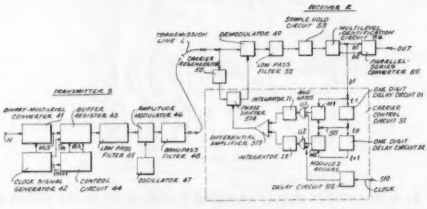
Shigehiko Hinoshita, Yokohama; Shoji Hagiwara, Tokyo, and Naohide Sata, Kokubunji, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed June 5, 1973, Ser. No. 367,170

Claims priority, application Japan, June 9, 1972, 47-57514

Int. Cl. H04l *3/00*

U.S. Cl. 325—38 B **4 Claims**



1. A multilevel signal transmission system for transmitting a signal via a transmission line, said transmission system comprising

transmitting means connected to one end of the transmission line, said transmitting means including means for inserting a reference level signal into a multilevel signal at predetermined intervals, the reference level signal having a lower level than the multilevel signal, and means for transmitting the multilevel signals and the reference level signals to the transmission line by carrier band; and receiving means connected to the other end of the transmission line for receiving transmitted signals, said receiving means included demodulating means for demodulating the received transmitted signals and deriving a demodulation carrier therefrom, said demodulating means including a demodulator producing a demodulated signal, means for detecting intersymbol interference which is used as a control signal between the reference level signal and adjacent multilevel signals from the demodulated signal of the demodulator, and means coupled between the detecting means and the demodulating means for controlling the phase of the demodulation carrier derived from the received signal by the demodulating means at

the demodulator in accordance with the intersymbol interference.

3,860,872
MULTIPLE RECEIVER SELECTION SYSTEM

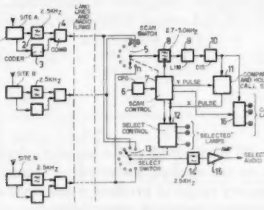
John Bernard Richardson, and Anthony Keith Sharpe, both of Cambridge, England, assignors to Pye Limited, Cambridge, England

Division of Ser. No. 112,108, Feb. 2, 1971, Pat. No. 3,761,822. This application Feb. 5, 1973, Ser. No. 329,865

Claims priority, application Great Britain, Feb. 5, 1970, 5517/70

Int. Cl. H04b *1/06, 7/04*

U.S. Cl. 325—304 **11 Claims**



1. Apparatus for selecting the highest quality signal from a plurality of signals each containing a signal component carrying identical information and an additional signal component related to the quality thereof, comprising input means for separately receiving said signals, scan control means including sequential driving means, first switching means driven by said driving means for scanning the signals from said input means in successive scanning cycles, signal processing means for providing voltages proportional to the additional signal components from said first switching means, selection control means for producing pulses from the highest voltage of said signal processing means during each scanning cycle, and second switching means connected to said input means and controlled by said selection control means for selecting the highest quality signals from said input means during successive scanning cycles in response to the pulses of said selection control means.

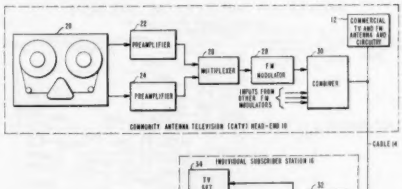
3,860,873
FM TRANSMISSION SYSTEM

John E. Ringstad, Huntington Beach, Calif., assignor to Tape-Athon Corporation, Inglewood, Calif.

Filed Oct. 1, 1971, Ser. No. 185,564

Int. Cl. H04b *3/54*

U.S. Cl. 325—308 **2 Claims**



1. For use in a cable television system, apparatus for transmitting at least one audio signal through the system as an FM signal which is outside the normal commercial FM transmission band comprising:

means including transducer means for providing a plurality of audio signals;

means responsive to the audio signals for stereo multiplexing the audio signals;

means coupled to the stereo multiplexing means and responsive to the stereo multiplexed audio signals for generating corresponding FM stereo multiplexed signals having carrier frequencies outside the normal commercial FM transmission band; and

means coupled to a cable of a cable television system and responsive to the FM signals for transmitting the FM signals over the cable when coupled thereto, said transmitting means comprising a transformer tree coupling the plurality of FM signals to the cable, the transformer tree comprising a different symmetrical bifilar transformer coupled to receive each pair of the FM signals at a pair of inputs thereof, a different asymmetrical bifilar transformer coupled to each symmetrical bifilar transformer and having a single output, the single output of each pair of symmetrical bifilar transformers being coupled to the inputs of a symmetrical bifilar transformer intercoupled with an asymmetrical bifilar transformer having a single output so that a single output of an asymmetrical bifilar transformer comprises a single output of the transformer tree, the single output of the transformer tree being coupled to the cable.

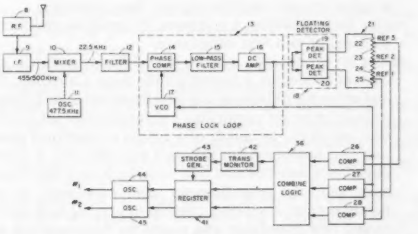
3,860,874
RECEIVER FOR DESK SIGNALS

James T. Malone, Syracuse; Richard L. Brennan, Marietta, both of N.Y., and Donald D. Hallock, Sandy, Oreg., assignors to The United Sates of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 4, 1973, Ser. No. 421,568

Int. Cl. H04l *27/14*

U.S. Cl. 325—320 **10 Claims**



1. Apparatus for receiving a DFSK signal composed of intervals of f_1, f_2, f_3 or f_4 which represent progressively higher frequencies and designate mark or space signals on a pair of canals comprising in combination

means for detecting said DFSK signals and for producing therefrom a DC signal whose amplitude is proportional to the frequencies of said DFSK signal;

means for establishing first, second and third reference voltage levels from the DC signals produced from f_1 and f_4,

said first, second and third levels being between the amplitudes of the DC signals produced from f_1 and f_2, f_2 and f_3, and f_3 and f_4, respectively;

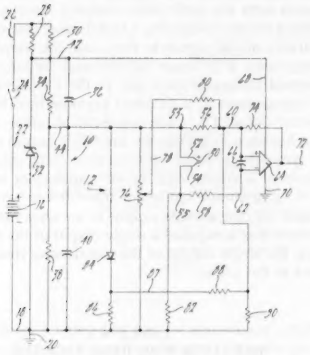
means for developing a binary signal indicative of the number of said levels that are exceeded by the DFSK signal being detected; and

means for converting said binary signal into two mark or space signals.

3,860,875
THERMOCOUPLE-CONTROLLED OPERATIONAL AMPLIFIER CIRCUIT

Dana R. Darnell, Southgate, and Clarence E. Harrison, Jr., Madison Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 4, 1974, Ser. No. 430,816
Int. Cl. G01k 7/00
U.S. Cl. 328—3 8 Claims



1. A thermocouple-controlled operational amplifier circuit which comprises:

an operational amplifier having first and second input terminals;

a first impedance having a first terminal connected to said amplifier first input terminal and having a second terminal;

a thermocouple having a first lead coupled to said second terminal of said first impedance and having a second lead coupled to said amplifier second input terminal;

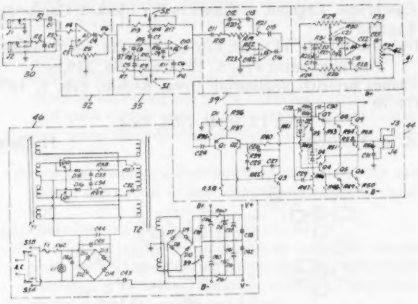
means for establishing a reference potential at said second terminal of said first impedance;

means for producing a current in said first impedance, said current producing a potential difference across said first and second terminals of said first impedance, said current producing means comprising a potentiometer for connection across the terminals of a source of electrical potential, said potentiometer having a movable arm, a second impedance between said first terminal of said first impedance and said potentiometer arm, movement of said potentiometer arm being capable of varying said current in said first impedance and means for compensating said thermocouple for variations in ambient temperature by the variation of said current in said first impedance, said temperature compensating means including a third impedance having a first terminal coupled to said first terminal of said first impedance and having a second terminal, and a semiconductor PN-junction device, one terminal of said PN-junction device being coupled between said second terminal of said first impedance and said second terminal of said third impedance, said PN-junction device being forward-biased upon application of said reference potential to said second terminal of said first impedance; whereby, when said thermocouple-controlled operational amplifier circuit is appropriately connected to a source of electrical potential, current flowing through said first impedance may be varied by changes in the position of said potentiometer arm thereby, to permit calibration of said amplifier circuit, and by changes in the potential difference occurring across said PN-junction device, thereby, to achieve compensation of said amplifier circuit for changes in ambient temperature of said thermocouple.

3,860,876
MUSICAL APPARATUS

Walter Woods, 124 S. Avenue 63, Los Angeles, Calif. 90042

Filed Nov. 24, 1972, Ser. No. 309,153
Int. Cl. H03k 1/16
U.S. Cl. 328—167 23 Claims



1. Apparatus for performing a filtering and selective amplifying function on an applied waveform or signal having a particular frequency range to produce a response curve having a given frequency spectrum, comprising:

means for generating a lower-range waveform having a roll-off portion that is anchored at a given anchoring frequency, and for independently and selectively amplifying said lower-range waveform while substantially maintaining said anchoring frequency;

said roll-off portion having a relatively-steep configuration;

means for generating an upper-range waveform having a roll-on portion that is anchored at substantially said anchoring frequency, and for indenpendently and selectively amplifying said upper-range waveform while substantially maintaining said anchoring frequency;

said roll-on portion having a relatively-steep configuration;

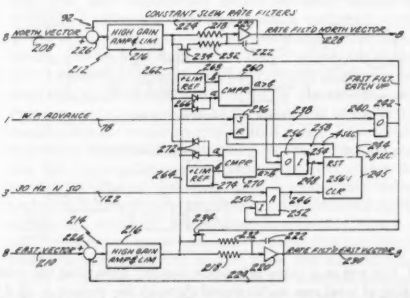
means for combining said lower-range waveform and said upper-range waveform to produce said desired response curve;

said response curve having a peak-shaped notch that is substantially centered at said anchoring frequency.

3,860,877
CONSTANT SLEW RATE FILTERING

John E. Games, Granby; Clarence Casper, Jr., Windsor, and Lertram F. Kupersmith, Bloomfield, all of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Division of Ser. No. 367,070, June 4, 1973,. This application Jan. 31, 1974, Ser. No. 438,309
Int. Cl. H04b 15/00
U.S. Cl. 328—167 4 Claims



4. A constant slew rate filter means according to claim 3 wherein said timing means further comprises bistable means

responsive to a control signal for removing the forced reset to said counter means and for instantaneously generating said operation signal as an alternative to the input of said counter means; and

means responsive to a predetermined count of said counter means less than that which normally generates said operation signal for resetting said bistable means.

3,860,878

TEMPERATURE COMPENSATION CIRCUIT FOR A MULTI-FREQUENCY RECEIVER

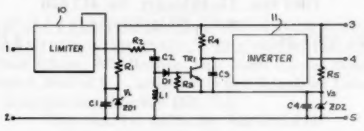
Yuji Tanaka; Matsuo Takaoka, both of Kawasaki, and Kazuhiro Gosho, Yokohama, all of Japan, assignors to Nippon Tsu Shin Kogyo K.K., Kanagawa-ken, Japan and TIE/-Communications Inc., Stamford, Conn.

Filed Apr. 5, 1973, Ser. No. 348,100

Claims priority, application Japan, Jan. 13, 1973, 48-12512

Int. Cl. H03c *3/04*

U.S. Cl. 329—136 **3 Claims**



1. A frequency detection circuit comprising: an input amplitude limiter circuit means having a constant output signal level over a predetermined range of input signal levels, and having a positive output signal level temperature coefficient; at least one tuned bandpass circuit means for coupling said output signal to the next mentioned means; and at least one threshold detection means having a negative threshold level temperature coefficient for deriving a D-C output signal in response to the output of said tuned circuit lying within the bandwidth thereof, wherein the improvement comprises, in combination, means, coupled to said limiter means and including a first zener diode means having a negative temperature coefficient, for setting the output level of said limiter circuit means independently of its temperature by compensating for the positive temperature coefficient of said limiter circuit means; and means, coupled to said threshold detection means and including a second zener diode means having a positive temperature coefficient, for setting the conduction level of said threshold detection means, and for compensating for the negative temperature coefficient of said threshold detection means.

3,860,879

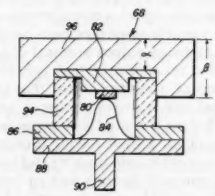
BROADBAND LOW NOISE PARAMETRIC AMPLIFIER

David N. McQuiddy, Jr., and Truman G. Blocker, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 26, 1973, Ser. No. 427,898

Int. Cl. H03f *7/04*

U.S. Cl. 330—4.9 **11 Claims**



1. A low noise parametric amplifier for use with a radar receiver comprising:

a Gunn diode oscillator for generating a pump frequency,

a bandpass filter for filtering said pump frequency,

a waveguide for transmitting said filtered pump frequency, said waveguide having a reduced height portion employing a multi-section Chebycheff transformer,

a coaxial signal input line extending to said waveguide,

a coaxial idler section having a center conductor for terminating said signal input line and for providing matching at the signal and idler frequencies,

a varactor diode assembly mounted on said center conductor between said signal input line and said idler section, and

a cup member attached to said diode assembly for matching the parallel resonance of said diode assembly to said pump frequency.

3,860,880

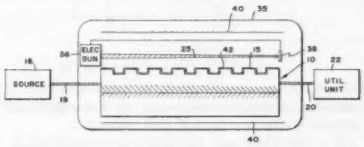
TRAVELLING WAVE OPTICAL AMPLIFIER AND OSCILLATOR

Amnon Yariv, and Desmond R. Armstrong, both of Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed May 18, 1973, Ser. No. 361,403

Int. Cl. H03f *3/58*

U.S. Cl. 330—5 **6 Claims**



1. A travelling wave optical amplifier comprising:

a dielectric optical waveguide supportive of an optical beam of a wavelength λ in the optical region, said waveguide having first and second opposite ends and a top surface extending between said ends, said top surface being characterized by periodic corrugations with a periodicity L, between said ends;

an evacuated envelope containing therein at least said corrugated top surface of said waveguide;

means in said envelope for providing a focused electron beam in said envelope with an electron velocity definable as v_e, said electron beam being in close proximity to said corrugated top surface and extending in a direction parallel thereto; and

input means for directing an optical beam of wavelength λ to said waveguide which enters said waveguide through said first end, whereby said optical beam is amplified in said waveguide and the amplified optical beam exits said second end when λ is not less and substantially equal to $c/v_e L$, where c is the speed of light.

3,860,881

RADIO FREQUENCY AMPLIFIER

Ralph Etherington, and Henry W. Riviere, both of Lynchburg, Va., assignors to General Electric Company, Lynchburg, Va.

Filed Sept. 12, 1973, Ser. No. 396,350

Int. Cl. H03f *3/04*

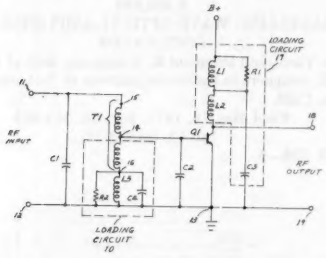
U.S. Cl. 330—21 **1 Claim**

1. An improved radio frequency power amplifier comprising:

a. a pair of input terminals to which a band of radio frequency signals at a selected center frequency are applied for amplification;

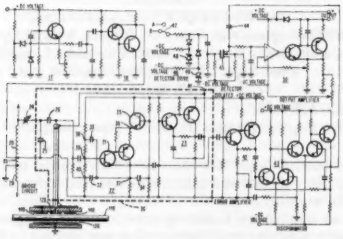
b. an impedance matching transformer having a winding with a tap intermediate its first and second ends to provide first and second portions respectively having a predetermined impedance relation;

c. means connecting said first transformer end to one of said input terminals;
d. a common terminal;
e. means connecting said common terminal to the other of said input terminals;
f. a first capacitor connected between said one input terminal and said common terminal;
g. a power amplifier transistor having an emitter, a base, and a collector;
h. means connecting said transistor base to said transformer winding tap;
i. a second capacitor connected between said transistor base and said common terminal;
j. means connecting one end of the emitter-collector path of said transistor to said common terminal;



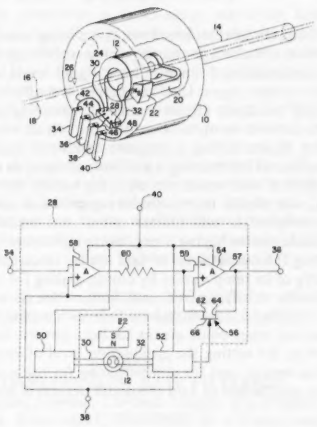
k. an output circuit connected to the other end of said emitter-collector path of said transistor;
l. and a low frequency loading circuit comprising:
1. said second portion of said impedance matching transformer;
2. a resistor, a capacitor, and an inductor connected in a parallel circuit;
3. means connecting said parallel circuit between said second transformer end and said common terminal;
4. said loading circuit capacitor providing a relatively low impedance at said frequency band, and providing a relatively high impedance at lower frequencies to be eliminated so as to cause said loading circuit resistor to load and reduce said low frequency oscillations.

3,860,882
CONTINUOUS CONDITION MEASURING SYSTEM
Frederick L. Maltby, Jenkintown, and L. Jonathan Kramer, Devon, both of Pa., assignors to Drexelbrook Controls, Inc., Glenside, Pa.
Division of Ser. No. 141,839, May 10, 1971, Pat. No. 3,781,672. This application Aug. 17, 1973, Ser. No. 389,126
Int. Cl. H03f *1/08*
U.S. Cl. 330—26 **1 Claim**



1. A buffer amplifier comprising:
a unity gain amplifier which includes:
a high-gain amplifier,
a second amplifier directly coupled to said high-gain amplifier, said second amplifier providing a substantially 100 per cent voltage feedback to said high-gain amplifier, the output to said unity gain amplifier being capacitatively bootstrapped to the input of said unity gain amplifier, said input acting as the input to said buffer amplifier,
an emitter follower amplifier capacitatively coupled to the output of said unity gain amplifier to supply power to said unity gain amplifier from a source which is of the same A.C. potential as the output of said buffer amplifier, and a capacitative coupling between the output to said buffer amplifier and the input to said unity gain amplifier.

3,860,883
MAGNETICALLY OPERATED ELECTRONIC GAIN CONTROL
Victor Maurice Bernin, Mount Prospect, Ill., assignor to Illinois Tool Works, Inc., Chicago, Ill.
Filed Mar. 22, 1974, Ser. No. 453,620
Int. Cl. H03g *3/30*
U.S. Cl. 330—29 **2 Claims**



1. A contactless self-contained electrical control device comprising a housing, an integrated circuit chip mounted in said housing, a plurality of leads extending from said housing and electrically connected to the circuit of said chip, said circuit comprising output means, an amplifier having an input terminal for receiving an input signal, an output terminal for supplying an output signal, control means having a control terminal and a variable resistance path coupled between said input terminal and said output terminal of said amplifier, the magnitude of the resistance of said variable resistance path being a function of a control signal that is coupled to said control terminal and a driver means; a saturable magnetic torroidal core having a central axis mounted in said housing, a permanent magnet, a shaft having a central axis rotatably mounted with respect to said housing and having an inner end which extends into said housing and an outer end which extends outwardly of said housing, a support means mounted on said inner end of said shaft for supporting said permanent magnet in said housing in proximity to said magnetic core, said central axis of said core being offset from said central axis of

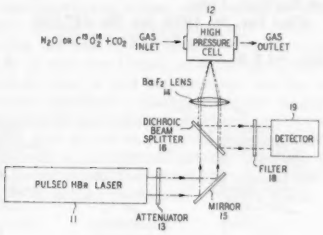
said shaft so as to provide an air gap spacing between said permanent magnet and said core which is continuously variable as a function of a rotation of said shaft, a primary transformer winding which passes through said magnetic core and which has its ends connected to said circuit on said chip, a transformer secondary winding which passes through said magnetic core and which has its ends connected to said circuit on said chip, said driver means being constructed to supply a time-varying electrical signal to said primary winding and said output means being coupled to said secondary winding and to said control terminal for supplying said control signal to said control means, the position of said magnet being controlled by the rotation of said shaft so that the air gap spacing between said magnet and said torroidal core is regulated to any value that lies in a range between an air gap spacing at which said magnetic core is magnetically saturated to an air gap spacing at which said magnetic core is magnetically unsaturated and only a minor portion of the magnetic flux from said permanent magnet effects said magnetic core.

3,860,884

OPTICALLY PUMPED LASER USING N_2O OR SIMILAR GAS MIXED WITH ENERGY-TRANSFERRING CO_2

Tao-Yuan Chang, Middletown, and Obert Reeves Wood, II, Holmdel, both of N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Oct. 10, 1973, Ser. No. 405,016
Int. Cl. H01s *3/22*
U.S. Cl. 331—94.5 G **10 Claims**



1. Apparatus for the stimulated emission of coherent radiation comprising means for containing a mixture of N_2O and CO_2 at pressures greater than one atmosphere, a mixture of N_2O and CO_2 being contained in said containing means at total pressure greater than one atmosphere, the partial pressure of N_2O exceeding that of CO_2, means for optically pumping the mixture to excite the 00°1 vibrational level of CO_2 sufficiently to invert the populations of a pair of vibrational-rotational levels of the N_2O by vibration-vibration energy transfer from said CO_2 level, and means for stimulating the emission of coherent radiation from the inverted N_2O levels.

3,860,885

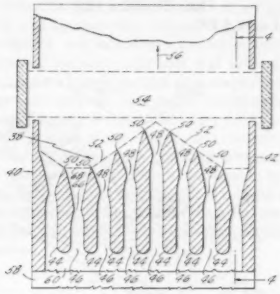
GAS LASER EXPANSION NOZZLES

George H. McLafferty, Manchester, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Mar. 13, 1973, Ser. No. 340,866
Int. Cl. H01s *3/02*
U.S. Cl. 331—94.5 P **5 Claims**

1. In a flowing gas laser system for the production of an optical beam and including a channel having a flow axis in a direction along which the velocity of a gaseous working medium is increased to permit stimulated emission of laser radiation from the energy levels of the medium, nozzle means for aerodynamically expanding the medium to a supersonic velocity, the improved nozzle means comprising:

a plurality of individual nozzle elements, each of which has a centerline axis extending longitudinally therethrough, the nozzle elements being juxtaposed across the channel with each centerline axis being aligned parallel to the flow axis, a portion of each pair of adjacent elements forming



a common throat region therebetween, with each throat region being displaced along the flow axis with respect to the throat region adjacent thereto.

3,860,886

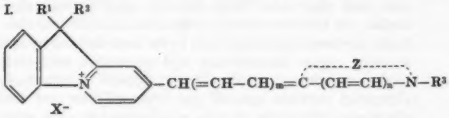
DYE LASER AND METHOD

William C. McColgin, and Derek D. Chapman, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 4, 1973, Ser. No. 394,378
Int. Cl. H01s *3/20*
U.S. Cl. 331—94.5 L **16 Claims**

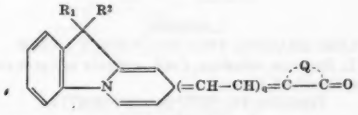
1. A dye laser comprising means containing a laser dye solution and a pumping energy source operably coupled therewith for producing a population inversion in said solution and means optically coupled with said solution for stimulating emission therefrom during said population inversion, said solution comprising a lasing concentration of a lasing dye in a non-interfering solvent, said dye having a formula as follows:

I.



or

II.



wherein:

R^1 and R^2 each represent an alkyl group or together represent the atoms necessary to complete a cycloalkyl group;

m and *n* each represent an integer having a value of 0 or 1;

q represents an integer having a value of 1 or 2;

R^3 represents an alkyl group, an alkenyl group and an aryl group;

Z represents the non-metallic atoms necessary to complete a heterocyclic nucleus containing five or six atoms in the heterocyclic ring;

X^- represents an anion; and

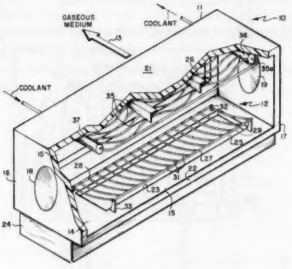
Q represents the non-metallic atoms necessary to complete a five- or six-membered cyclic ring of the type used in merocyanine dyes.

3,860,887

ELECTRICALLY EXCITED HIGH POWER FLOWING GAS DEVICES SUCH AS LASERS AND THE LIKE

Ethan D. Hoag, Boston, and Edward V. Locke, Rockport, both of Mass., assignors to Avco Corporation, Cincinnati, Ohio

Filed Oct. 20, 1972, Ser. No. 299,415
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 PE **11 Claims**



1. In apparatus for producing a controlled discharge for providing molecular excitation of a gaseous working medium including means having walls defining a cavity having a working region disposed therein, gas supply means for producing a flow of a gaseous working medium through said working region, said working region being generally rectangular in a plane parallel to the direction of flow of said medium, means for providing ionizing radiation in said working region and ionizing said working medium flowing through said working region, the combination comprising:

a. first and second oppositely positioned electrodes each having a length and width dimension corresponding substantially to that of said rectangular working region for applying aa voltage across substantially all of said working region, said electrodes each being reticulated to permit the passage of a gas through them, said electrodes being disposed within said means defining said cavity in spaced relationship thereto and being positioned and formed whereby a portion of said working medium adjacent said electrodes flows through each of said electrodes, the effective area encompassed by each said electrode conforming substantially to the area defined by said working region intermediate said electrodes, said electrodes comprising a plurality of narrow substantially elongated portions spaced one from another and said electrodes effectively diverge with respect to each other in the direction of flow of said working medium.

3,860,888

TIME-SHARING TWO FREQUENCY LASER

Ronald L. Stephens, Altadena, Calif., assignor to Xerox corporation, Stamford, Conn.

Filed July 19, 1973, Ser. No. 380,771
Int. Cl. H01s *3/10*
U.S. Cl. 331—94.5 C **7 Claims**

1. A laser apparatus operable at at least two frequencies comprising:

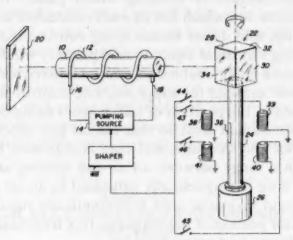
a resonant cavity having first and second ends disposed from each other along an optical axis to define a single optical path therebetween,

an active laser medium within said cavity, said laser medium disposed along said optical axis and being adapted to produce radiation transitions between a first pair of energy levels and a second pair of energy levels,

pumping means for exciting said laser medium to produce radiant energy of a first frequency and radiant energy of a second frequency corresponding to said radiation transitions,

a fixed, partially reflective mirror terminating said first end of said cavity, and

rotating means for terminating said second end of said cavity with a first surface having a reflection coefficient



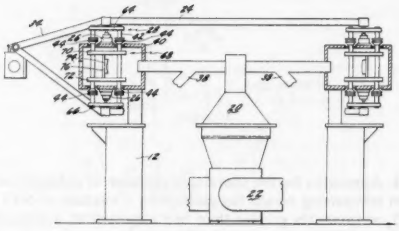
more favorable to generation of light of said first frequency than light of said second frequency, and then with a surface having a reflection coefficient more favorable to generation of light of said second frequency than light of said first frequency.

3,860,889

STABLE PLATFORM STRUCTURE FOR LASER OPTICS

Antonio B. Caruolo, Vernon, and Jack W. Davis, East Hartford, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 26, 1973, Ser. No. 427,959
Int. Cl. H01s *3/02*; **F16f** *15/02*
U.S. Cl. 331—94.5 R **6 Claims**



1. In a gas laser system of the apparatus comprising:

a first and a second enclosed optical platform housing cooperatively disposed at opposite ends of the laser system and fixedly joined to one another;

a first and a second support leg each of which is fixedly joined to a corresponding first and second optical platform housing, the support legs extending from the housing to a reference ground;

a first and second optical platform assembly each of which penetrates the close of a corresponding platform housing, each platform assembly comprising:

an upper and a lower platform assembly plate;

a plurality of connection rods each of which has a first and a second end and passes completely through the platform housing, the rods being fixedly attached near the first end to the upper platform plate and fixedly attached near the second end of the lower platform;

an optical bench internal to the platform housing and fixedly attached to the rods; and

reflection surfaces fixedly joined to the optical bench;

an optical platform truss which is fixedly attached to the first and the second optical platform assemblies to form a rigid optical structure; and

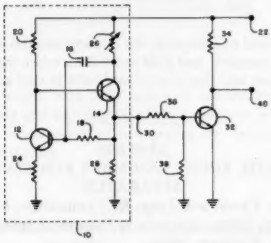
a plurality of vibration mounts interposed between the optical structure and the optical platform housings to support the optical structure while simultaneously insulating the optical structure from disturbances in the platform housings.

3,860,890

TEMPERATURE STABLE RC OSCILLATOR

Ronald G. Husa, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Jan. 2, 1974, Ser. No. 430,312
Int. Cl. H03k *3/282*
U.S. Cl. 331—111 **6 Claims**



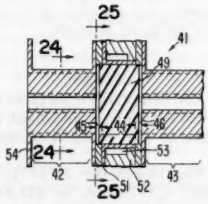
1. A temperature stable, free running oscillator comprising a first transistor having a base, collector and emitter; a second transistor having a base, collector and emitter; means for connecting the base of said second transistor directly to the collector of said first transistor; a timing capacitor coupled between the base of said first transistor and the collector of said second transistor; a discharge resistor coupled between the base of said first transistor and the emitter of said second transistor; first resistor means for coupling a bias voltage to the collectors of said first and second transistors; and second resistor means for coupling ground potential to the emitters of said first and second transistors.

3,860,891

MICROWAVE WAVEGUIDE WINDOW HAVING THE SAME CUTOFF FREQUENCY AS ADJOINING WAVEGUIDE SECTION FOR AN INCREASED BANDWIDTH

Yukio Hiramatsu, Los Altos, Calif., assignor to Varian Associates, Palo Alto, Calif.

Continuation-in-part of Ser. No. 102,590, Dec. 30, 1970, abandoned. This application June 11, 1973, Ser. No. 368,806
Int. Cl. H01p *1/08, 5/08*
U.S. Cl. 333—21 R **15 Claims**



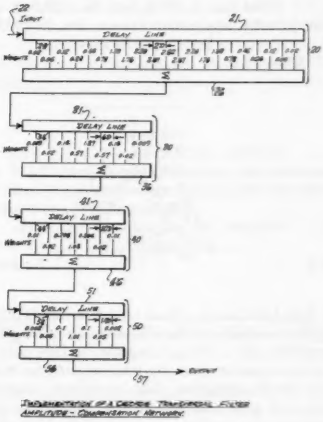
1. In a microwave waveguide window for propagation of microwave frequencies within a selected bandwidth, hollow waveguide means, microwave dielectric window means hermetically sealed across said waveguide to define a first dielectric window-filled waveguide section interposed between second and third waveguide sections, said first, second and third waveguide sections are dimensioned to have approximately the same cutoff wavelength, whereby each of said first, second and third waveguide sections will support approximately the same number of waveguide transmission modes, said first waveguide section having a dielectric-filled length l, which is less than one wavelength long at the center frequency of said selected bandwidth, said second section of waveguide having substantially less characteristic impedance than said first section of waveguide, and including a transition section of waveguide interposed between said first and second sections of waveguide, said transition section of waveguide dimensioned to have approximately the same cutoff wavelength as said first and second waveguide sections and being substantially shorter than said first section of waveguide, and wherein said dielectric window material protrudes from said first section of waveguide into said transition section of waveguide by an amount substantially less than the length of said transition section of waveguide, whereby wave reflections from the waveguide transition from said second to said first waveguides are effectively cancelled.

3,860,892

CASCADE TRANSVERSAL FILTER AMPLITUDE-COMPENSATION NETWORK

Jeffrey M. Speiser, and George W. Byram, both of San Diego, Calif., assignors to The United States of Americas as represented by the Secretary of the Navy

Filed Feb. 25, 1974, Ser. No. 445,366
Int. Cl. H03h *7/28, 7/30*
U.S. Cl. 333—70 T **2 Claims**



1. An amplitude-compensating network, with zero phase shift or shift varying linearly with frequency, and specified attenuation as a function of frequency, comprising:

a cascaded combination of simple transversal filters, including an input transversal filter connectable to an input signal, the filters of the combination having transfer functions from input to output, of $H_1(f)$, $H_2(f)$, . . . , $H_n(f)$, where each of the terms $H_n(f)$ is defined by the equation

$$H(f)=e^{Q(f)}=e^{\sum_{k=0}^{\infty} Q_k \cos 2\pi kfd}$$

where $k = 1, 2, \ldots$, and d^{-1} is the period of H(f); each transversal filter comprising:

a plurality of tapped, weighted elements, the tap weightings being determined from the relationship,

$$g_m = \begin{cases} (_m(q), \text{ if q is positive} \end{cases}$$

where I_m denotes the mth modified Bessel function of the first kind and q is a constant equal to Q_k for the kth filter;

the cascaded transversal filters having a tap spacing of d, beginning with the input transversal filter, and having a tap spacing of nd, $n = 1, 2, 3, \ldots$, for successive transversal filters in the cascade;

a plurality of signal summers, one for each transversal filter, the inputs to each signal summer being the outputs of the tapped, weighted, elements of the delay line of the the associated transversal filter;

the output of the last signal summer, associated with the last delay line, the one in the cascade furthest removed from the input delay line, being the output of the amplitude-compensation network.

3,860,893

WIDE BAND ACTIVE CIRCUIT THREE-PORT CIRCULATOR FOR ULTRA-HIGH FREQUENCIES AND MICROWAVES

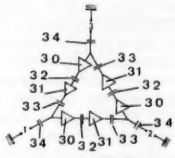
Raymond Ropars, and Jean-Yves Herve, both of Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed Jan. 2, 1974, Ser. No. 429,741

Claims priority, application France, Jan. 2, 1973, 73.0013

Int. Cl. H03h *7/44*

U.S. Cl. 333—80 R **4 Claims**



1. A wide band active circuit circulator made of three identical gyrators serially interconnected comprising each a current amplifier and a voltage amplifier serially connected and three ports respectively at the interconnections between two gyrators which comprises first capacitive coupling means between each port and the input of the connected gyrator, second capacitive coupling means between each port and the output of the connected gyrator, third capacitive coupling means between said current and voltage amplifiers of the same gyrator, and a single supply means for said amplifiers one output of which is earthed.

3,860,894

SOLENOID

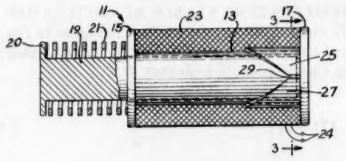
Djordje R. Popovic, Chicago, and Vahram K. Sarrafian, Glenview, both of Ill., assignors to Wico Corporation, Niles, Ill.

Filed May 17, 1974, Ser. No. 471,020

Int. Cl. H01t *7/08*

U.S. Cl. 335—258 **12 Claims**

1. A solenoid assembly comprising a plunger of magnetic material, said plunger being guided along a rectilinear path from a first end of said path to a second end of said path, a first member of magnetic material partially encircling a first part of the circumference of said path at said second end of said path and a second member of magnetic material partially encircling a second part of the circumference of said path at



said second end of said path, the circumferential encirclement of said first member and said second member increasing in a direction from said first end of said path to said second end of said path.

3,860,895

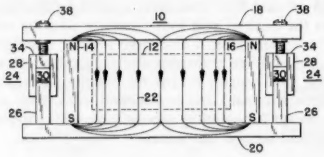
MAGNETIC SHUNT ASSEMBLY FOR BIAS FIELD APPARATUS

Ling George Chow, and Jonas K. Vysniauskas, both of Oklahoma City, Okla., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed May 28, 1974, Ser. No. 473,465

Int. Cl. H01f *3/00*

U.S. Cl. 335—298 **10 Claims**



1. For use with a bias field apparatus having parallel magnetically permeable plates and adjacent magnets for establishing a magnetic field in the volume bounded by the plates, an improved magnetic shunt assembly for adjusting the strength of the magnetic field comprising:

a. a magnetically permeable fixed member secured to one of the plates and extending toward the other of the plates;

b. a magnetically permeable movable member spaced from the plates and in sliding contact with the fixed member; and

c. means for adjusting the air gap between a surface of the movable member and the other of the plates to vary the reluctance of the shunt assembly.

3,860,896

AIR INDUCTIVE BALLAST

Jan Lambertus Van Der Hoek, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 213,448, Dec. 29, 1971,. This application Dec. 4, 1973, Ser. No. 421,513

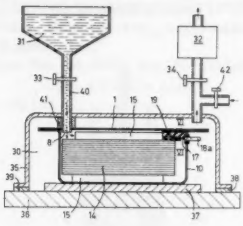
Claims priority, application Netherlands, Jan. 13, 1971, 7100411

Int. Cl. H01f *27/02*

U.S. Cl. 336—96 **2 Claims**

1. An inductive ballast comprising a housing, a coil carried within said housing, electrical conductors for connection of electrical power to said coil extending from said coil, a block of elastically deformable synthetic resin having closed cells carried within said housing on said conductors in a space

betwen said conductors and an adjacent wall of said housing so that when a vacuum is applied to said housing said space will be substantially filled by said block as a result of pressure



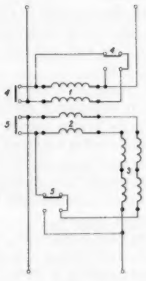
developing within said cells and said elastically deformable block swelling and enveloping said conductors, and a molding mass of resinous material occupying the remaining spaces within said housing.

3,860,897

WINDING RECONNECTION ARRANGEMENT FOR A WELDING APPARATUS

Ryszard Kuszleyko, Gliwice, Poland, assignor to Instytut Spawalnictwa, Gliwice, Poland

Filed Aug. 4, 1971, Ser. No. 168,985
Claims priority, application Poland, Aug. 13, 1970, 142671
Int. Cl. H01f *21/12*
U.S. Cl. 336—147 **2 Claims**



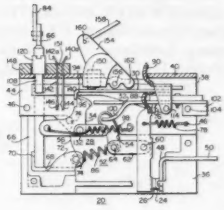
1. A power circuit for a welding apparatus, comprising a transformer connectable between a line-current source and a welding circuit load; a transductor connected in circuit with said transformer, said transformer having at least two equivalent primary windings connectable across said source and forming a first winding set and at least two equivalent secondary windings connectable across said load and inductively coupled with said primary windings while forming a second winding set, said transductor having at least two current-carrying windings connectable in circuit with the windings of one of said sets; and switch means having a first position electrically connecting said primary windings in parallel, said secondary windings in parallel and said current-carrying windings in parallel with one another and in series with the parallel connected windings of said one of said sets, and a second position electrically connecting said primary windings in series, said secondary windings in series, and said current-carry windings in series with said windings of said one of said sets.

3,860,898

CIRCUIT BREAKER FOR DISTRIBUTION TRANSFORMER

Merrill G. Leonard, Fowler, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 11, 1973, Ser. No. 396,162
Int. Cl. H01h *71/16*
U.S. Cl. 337—59 **11 Claims**



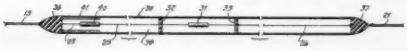
1. A circuit breaker comprising a first housing of molded insulating material, a second housing of metal on said first housing, a stationary contact on said first housing, a bimetal element having one end mounted in the second housing and having a flanged portion at the other end, a trip arm spaced from the bimetal element and composed of magnetically permeable material to effect movement toward the bimetal element, said trip arm being pivotally mounted on said second housing and having a support flange, a movable switch arm having a first contact for cooperation with said stationary contact, a second contact on said switch arm for cooperation with the flange, guide means on said first housing, a toggle link operatively connected to the switch arm and movable along said guide means, a latch pivotally mounted on the second housing to effect release of the trip arm when the bimetal element is actuated, and manual means connected to said toggle link for moving the first and second contacts to the open position.

3,860,899

STRUM NOISE REDUCING DEVICE

Francis W. Watlington, Coralita Pembroke, Bermuda, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 8, 1968, Ser. No. 766,382
Int. Cl. G01s *7/66*
U.S. Cl. 340—3 T **6 Claims**



1. A noise reducing device for substantially reducing or eliminating strum noise occasioned by towing by ship of underwater objects comprising:

a tow cable secured at one end to a towing ship;

a hydrophone housing secured at the other end of said tow cable,

said housing having a centrally disposed cavity and a viscous fluid in said cavity;

a hydrophone positioned axially in said cavity by a forwardly extending conductive connector and a rearwardly extending nonconductive connector,

said conductive connector extending to said ship through the forward end of said housing,

said nonconductive connector connected to the aft end of said housing;

cable strum sensing and transducing means in said cavity connected to said hydrophone and said housing for pro-

ducing an electric signal proportional to the strum of said cable; and

means for introducing said electric signal in opposition to the electric signals generated in said hydrophone so that strum noise signals in the signal output of said hydrophone are substantially eliminated.

3,860,900

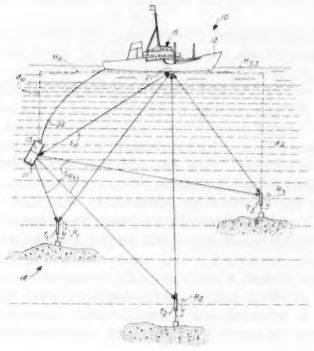
METHOD OF MONITORING THE POSITION OF TOWED UNDERWATER APPARATUS

Ronald J. Scudder, Winston-Salem, N.C., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Feb. 21, 1973, Ser. No. 334,320

Int. Cl. G01s *9/68, 5/18*

U.S. Cl. 340—3 R **4 Claims**



1. A method of monitoring the three-dimensional position of equipment towed underwater from a ship geographically positioned within the approximate geographic area bounded by an underwater network of at least three acoustic transponders of known geographic position and depth, the method comprising the steps of:

interrogating the transponders directly from the ship to determine acoustic travel times between the ship and the transponders;

fixing the geographic position of the ship relative to the transponders at the time of direct interrogation from the depths of the transponders and the direct interrogation acoustic travel times;

interrogating a remote-powered acoustic interrogation transducer associated with the towed equipment to determine acoustic travel times between the ship and the towed equipment and to interrogate each of the transponders by the interrogation transducer to determine acoustic travel times from the ship to the towed equipment to each of the transponders and back to the ship; and

fixing the three-dimensional position of the towed equipment relative to the ship from the geographic position of the ship, the depth of the transponders and the acoustic travel times between the ship and the towed equipment and the acoustic travel times from the ship to the towed equipment to each of the transponders and back to the ship.

3,860,901

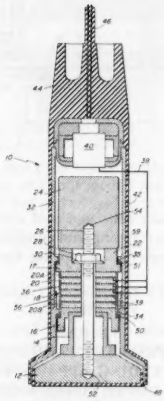
WIDE BAND TRANSDUCER

Stanley L. Ehrlich, Middletown, and Anthony F. Medeiros, Portsmouth, both of R.I., assignors to Raytheon Company, Lexington, Mass.

Filed June 1, 1973, Ser. No. 365,928

Int. Cl. H04b *13/00*

U.S. Cl. 340—10 **3 Claims**



1. A sonar transducer assembly comprising:

a front mass;

a front impedance matching means in acoustic contact with said front mass;

means for converting electrical energy into sonic energy, said converting means being coupled to said front impedance matching means;

a rear mass acoustically coupled to said converting means; said front mass, said front impedance matching means, said converting means and said rear mass being arranged along a common axis;

means positioned along said common axis and passing through said front impedance matching means and said converting means for urging together said front mass and said rear mass, said urging together means being secured to said front mass and being secured to a front portion of said rear mass to permit vibration of the remaining portion of said rear mass substantially free of a vibration of said urging together means;

a housing enclosing said front mass, said front impedance matching means, said converting means and said rear mass; said housing having a front projection and a rear projection which are inwardly directed for supporting said converting means;

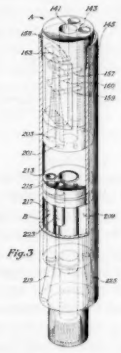
a front support in contact with a front surface of said converting means and a rear support in contact with a rear surface of said converting means, said front support having an outwardly directed projection forward of and adjacent said front housing projection, and said rear support having an outwardly directed projection foward of and adjacent to said rear support;

a front and a rear ring of acoustic isolation material positioned respectively between said front ring and said front support, and said rear ring and said rear support; said rings of acoustic isolation material being positioned adjacent a node of vibration of said converting means; and

said front impedance matching means having a cylindrical shape with front and back base sections joined by a cylindrical wall, said cylindrical wall having an inner radius and an outer radius, a thickness of said cylindrical wall being less than approximately one-half the outer radius, said rear base being in acoustic contact with said converting means and having a cross-sectional area less than the

cross-sectional area of said converting means, said front base being in acoustic contact with said front mass and having a cross-sectional area larger than said rear base.

3,860,902
LOGGING METHOD AND SYSTEM
Edward M. Galle, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.
Filed Feb. 14, 1973, Ser. No. 332,468
Int. Cl. G01v *1/40*
U.S. Cl. 340—18 LD **17 Claims**



1. A method of carrying out logging operations in a borehole comprising the steps of:

matching an acoustical oscillator operating frequency with the resonant frequency of an acoustical circuit that includes an acoustical coupler and a selected compliance to be partially formed by the wall of a borehole such that the oscillator will generate a selected signal which changes in response to compliance changes sensed by the oscillator; generating an acoustical signal in a borehole with said oscillator and coupler;

acoustically coupling said signal with a selected acoustical compliance having walls partially formed by a portion of the borehole;

moving said oscillator and said coupler up or down said borehole to expose differing portions of the borehole wall to sense compliance changes;

the characteristics of the wave form of the signal altering in response to sensed changes in said acoustical compliance; detecting characteristics of the wave form of the signal; and

recording said characteristics in correlation with borehole depth.

3,860,903
HIGH OUTPUT LOW BRIGHTNESS VENTILATED LUMINAIRE
Frank Van Steenhoven, Hudson, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Mar. 26, 1974, Ser. No. 454,984
Int. Cl. F21v *29/00*
U.S. Cl. 240—47 **14 Claims**

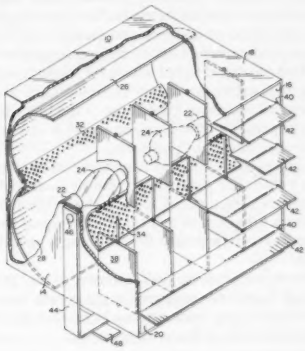
1. A high output, low brightness luminaire comprising:

a housing, including a back wall, side walls a top wall and a bottom wall;

a pair of opposed discharge lamp sockets mounted in said side walls approximately midway between said top wall and said bottom wall,

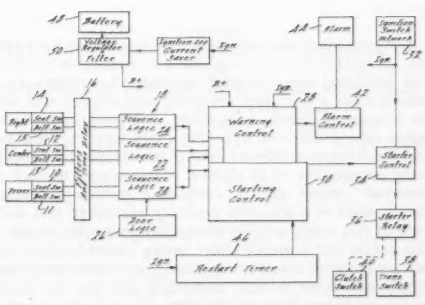
a pair of concave reflectors, one of said reflectors mounted adjacent the top half of said back wall and the other of said reflectors mounted adjacent the bottom half of said back wall,

a convex reflector mounted between said concave reflectors and overlying the bottom edge of the upper reflector and the top edge of the lower reflector, and;



a perforated shield extending across said housing from one side wall to the other side wall approximately midway between said top wall and said bottom wall forward of said opposed discharge lamp sockets, said perforated shield being constructed and arranged to shield the arc of discharge lamps mounted in said opposed sockets from view at normal viewing angles.

3,860,904
SEQUENCING BELT AND SEAT WARNING SYSTEM WITH VEHICLE START INHIBIT
Paul H. Andersen, Royal Oak, Mich., assignor to Chrysler Corporation, Highland Park, Mich.
Filed July 31, 1972, Ser. No. 276,634
Int. Cl. B60r *21/10*
U.S. Cl. 340—52 E **17 Claims**



1. In a motor vehicle having an engine, transmission, and occupant seating means and a safety belt at each of a predetermined number of occupant positions of said seating means, a sequencing safety belt warning and start inhibit system for inhibiting the start of the vehicle engine unless usage of the safety belt at each occupied position of said predetermined number of occupant positions is indicated to have occurred subsequent to occupancy thereof, said system comprising:

safety belt switch means operatively associated with the safety belt at each one of the predetermined occupant

positions for generating and maintaining a first electrical signal registering utilization of the safety belt;

seat switch means at each one of the predetermined occupant positions for generating and maintaining a second electrical signal registering the presence of an occupant occupying the corresponding position;

sequence logic means electrically connected in circuit for receiving said first and second electrical signals at each predetermined occupant position, said sequence logic means means including means for detecting the sequence of generation of said first and second electrical signals at each predetermined occupant position and for generating a third electrical signal whenever the second signal alone is generated at any of said predetermined occupant positions and whenever generation of the first signal precedes the generation of the second signal at any of said predetermined occupant positions;

ignition key switch means responsive to an attempt to start the vehicle for generating a fourth electrical signal;

alarm means responsive to said third signal from said sequence logic means and said fourth signal from said ignition key switch means for alarming a vehicle occupant; and

engine start control means responsive to said third electrical signal from said sequence logic means and said fourth electrical signal from ignition key switch means for inhibiting the start of the vehicle engine.

3,860,905

SPEED INDICATOR AND SPEED SIGNALLING DEVICE FOR VEHICLES IN GENERAL

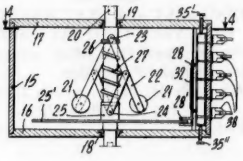
Mario Guerini, Via Cappuccini, 14, Milan, Italy

Filed July 3, 1973, Ser. No. 376,116

Claims priority, application Italy, July 5, 1972; Mar. 5, 1973, 21170

Int. Cl. B60q *1/54*

U.S. Cl. 340—62 **4 Claims**



1. A speed indicator and speed signalling device for a vehicle, characterized by the fact that it comprises, in combination: a rotating supported shaft adapted to be connected to a vehicle drive, a centrifugal governor supported by said shaft for rotation therewith, a signalling unit comprising electric lamps having different signalling characteristics, each one corresponding to a different value of vehicle speed, said lamps being connectable to an electric energy source through an electrical contact device, comprising stationary contacts spaced apart in a direction generally parallel to said shaft, each of said contacts being electrically connected to one of said lamps, and a mobile slider having electric contact elements connected to said energy source, said slider being operatively connected to said centrifugal governor for sliding movement therewith in the direction of said shaft, according to variations in the vehicle speed, said electric contact elements of the slider comprising two spaced contact members aligned in the direction of the reciprocating motion of the slider, with a distance between them substantially equal to the distance between the trailing edge of one of the fixed contacts and the leading edge of another of the fixed contacts, whereby, by the slider movement, when the vehicle speed varies, the electric feeding circuit of said lamps is completed, alternatively through one and the other of the contact members of the slider.

3,860,906

SELF-PROPELLED DIRECTION MARKER

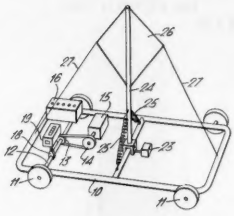
Malcolm Henry Browning, Park Farm Little Someborne, Stockbridge, England

Filed Sept. 12, 1973, Ser. No. 396,430

Claims priority, application Great Britain, Sept. 12, 1972, 42367/72

Int. Cl. B60q *1/00*

U.S. Cl. 340—135 **19 Claims**



1. A self-propelled movable direction marker device for guiding the path of a machine movable relative thereto, comprising a body provided with means enabling it to be moved over the ground, an indicator means carried on said body on which a sighting can be taken from said machine movable relative thereto, a motor driven transmission means for driving said first means, sensor means for sensing the distance the marker device is moved by said motor driven transmission means, means for cutting out the drive to said first mentioned means when the marker device has been moved a predetermined distance, and means for re-starting the drive when the machine has moved along the guided path, wherein said sensor means comprises a counter device for counting revolutions of a shaft of the transmission means, said counter being resettable by means operated by a radio signal emitted from the machine movable relative to the marker device.

3,860,907

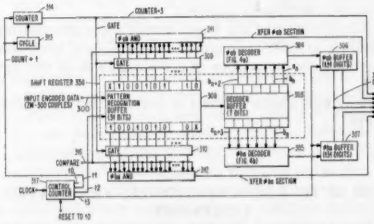
DATA RESYNCHRONIZATION EMPLOYING A PLURALITY OF DECODERS

John W. Marshall, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 21, 1973, Ser. No. 372,389

Int. Cl. G06k *5/00*

U.S. Cl. 340—146.1 D **23 Claims**



1. In a data subsystem for handling serial sequences of data representative digits, wherein the digits are serially recorded, effectively continuously along physically discontinuous diagonal stripes on an elongated medium, as pairs of adjacent magnetic manifestations corresponding to pairs of electric recording signals, coded to represent the digits in accordance with a predetermined relationship, the recorded digits being sensed by decoding pairs of electric read signals, each pair relating to a single pair of corresponding magnetic manifestations, in accordance with the predetermined relationship; apparatus

effective when electric read signal pairs erroneously relate to noncorresponding magnetic manifestations, comprising:

a shift register having one input for receiving electric read signal pairs in sequence, another input operable to shift the signals in one direction one pair at a time, and a plurality of outputs for supplying the received signals in parallel;

a first and second decoder each having inputs, connected to different sets of the shift register outputs, and outputs for supplying digits derived in accordance with the predetermined relationship as a function of the electric read signal pairs at that decoder's inputs;

a first and second memory buffer each having inputs connected to outputs of corresponding ones of the first and second decoders for storing a plurality of digits; and

first and second recognition circuits each having inputs connected to the shift register for receiving electric read signals and outputs supplying signals for selecting for accessing one of said first and second buffers in accordance with the occurrence of digit patterns in the shift register.

3,860,908

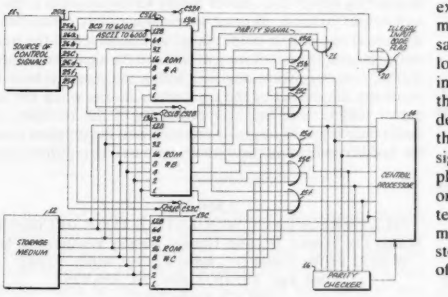
ROM MULTIPLE CODE CONVERSION APPARATUS

Lee N. Stratton, III, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Feb. 4, 1974, Ser. No. 439,499

Int. Cl. G06f *11/10*; **H03k** *13/34*

U.S. Cl. 340—146.1 AG **6 Claims**



3. Multiple code conversion apparatus for use with a storage medium and a central processor, said apparatus comprising:

first and second ROM code converters each having a plurality of signal input leads, a control lead, an illegal-input code flag lead and a plurality of signal output leads, each of said input leads of said converters being connected to said storage medium;

a source of control signals, said source being connected to said control lead of each of said converters;

a plurality of logic gates each having first and second input leads and an output lead, said first input lead of each of said logic gates being connected to a corresponding one of said signal output leads of said first converter, said second input lead of each of said logic gates being connected to a corresponding one of said signal output leads of said second converter, said output lead of each of said logic gates being connected to said central processor; and

a gating means having first and second input leads and an output lead, said first input lead of said gating means being connected to said illegal-input code flag lead of said first converter, said second input lead of said gating means being connected to said illegal-input code flag lead of said second converter, said output lead of said gating means being connected to said processor.

3,860,909

APPARATUS FOR RECOGNIZING GRAPHIC SYMBOLS

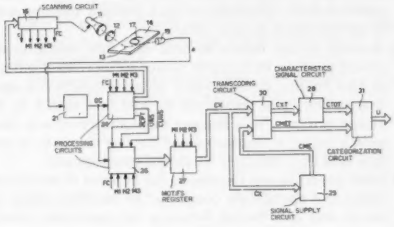
Filippo Demonte, Borgofranco D'Ivrea, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Apr. 15, 1971, Ser. No. 134,129

Claims priority, application Italy, Apr. 16, 1970, 68284/70

Int. Cl. G06k *9/00*

U.S. Cl. 340—146.3 AC **12 Claims**



1. Apparatus for recognizing graphic symbols, comprising means for exploring each symbol along a succession of substantially parallel sections to generate a signal representing for each section a succession of contrasting segments of first and second kinds, and logical circuit means for examining in each section, the relationship of each segment of the first kind to the segments of the second kind and to a shadow of the segments of the second kind encountered in the sections already examined, said shadow comprising a projection of said segments encountered in said previously examined sections of said character on a line parallel to the scanning direction, said logical circuit means comprising first register means for storing a signal indicating the duration of each such segment of the first kind and second register means for storing a signal defining the length of the projection defining said shadow of the segments of the second kind, means for assigning the signals representing the segments of the first kind to one of a plurality of register means for storing motifs of different types on the basis of the signals stored in said first and second registers, and categorizing means responsive to the combination of motifs present in the explored symbol and stored in said motif storage register means to categorize explored symbols as one of the symbols to be recognized.

3,860,910

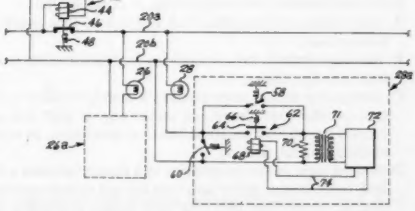
ELECTRICAL SWITCH SYSTEM FOR A HOUSE OR THE LIKE

David S. Hudson, 2000 Lakeside, Bellingham, Wash. 98225

Filed Aug. 13, 1973, Ser. No. 388,112

Int. Cl. H02j *13/00*; **H01h** *47/00*; **H04q** *9/00*

U.S. Cl. 340—147 R **11 Claims**



1. In an electrical power system for a house or the like, where there are a plurality of power outlets at various locations, a system which provides for individual operation of said outlets at their related locations for both activation and deac-

tivation of related outlets, and also for deactivation of said outlets from a master location without interference with subsequent individual activation and deactivation of said outlets, said system comprising:

a. a plurality of switch assemblies, each of which is operatively connected to at least a related one of said outlets for individual operation thereof, each switch assembly comprising:

1. a first normally open switch connected to its related outlet and having a closed position where it delivers power to said outlet and an open position where power is not delivered to said outlet,

2. holding circuit means to hold said first switch in its closed position to transmit power to its related outlet,

3. said holding circuit means being connected to said first switch to be energized by said first switch in its closed position, in a manner that closure of said first switch causes activation of said holding circuit to maintain said first switch in its closed position, and

4. other on-off means proximate the location of its related outlet and operatively connected to said first switch to move said first switch between its open and closed positions,

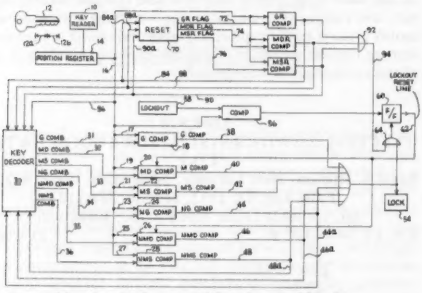
b. master switch means having an operating position to momentarily interrupt power to said switch assemblies whereby when said master switch means is moved to its operating position, each switch assembly has its holding circuit deactivated to cause its related first switch to return to its normally open position, whereupon operation of master switch causes deactivation of all of said switch assemblies, which remain deactivated until subsequent activation, as by its related on-off means.

3,860,911

ELECTRONIC COMBINATION LOCK AND LOCK SYSTEM

Bruce E. Hinman, Ridgefield; Gregory M. Cinque, Stamford, and William D. Soltow, Jr., Riverside, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Nov. 1, 1973, Ser. No. 411,650
Int. Cl. G06k *7/06;* **H04q** *9/00*
U.S. Cl. 340—149 R **20 Claims**



1. A combination lock comprising, in combination:

A. entry means for accepting first and second lock combination entries;

B. first logic means for establishing first and second stored lock combinations;

C. comparing means responsive to a match between a first lock combination entry and either one of said first and second stored lock combinations for developing an access enabling signal; and

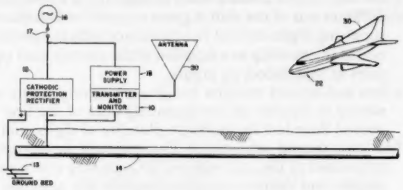
D. second logic means responsive to a match between a first lock combination entry and said second stored combination for controlling said first logic means to replace said first stored combination with said second stored combination, and said second stored combination with the second lock combination entry associated witth said first lock combination entry.

3,860,912

POWER SUPPLY MONITORING DEVICE

Gleason Romans, Tulsa, Okla., assignor to Aviation, Inc., Tulsa, Okla.

Filed Aug. 8, 1973, Ser. No. 386,850
Int. Cl. G08b *21/00*
U.S. Cl. 340—152 T **9 Claims**



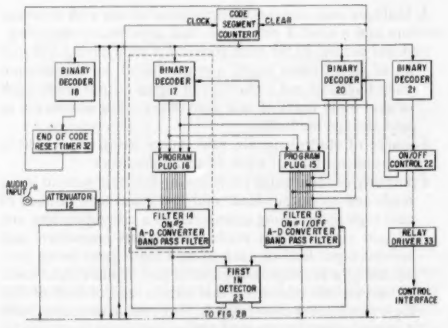
1. A power supply monitoring device for monitoring the output of remote power line connected cathodic protection rectifiers along a pipeline from a pipeline patrol vehicle and comprising transmitter means disposed adjacent to each power supply rectifier for transmitting a signal, monitoring means operably connected to the output of the cathodic protection rectifier for sensing the output current level thereof, signal modulating means operably connected to the transmitter means for modulating the transmitter signal, monitor switching means operably connected between the monitor means and the signal modulating means for keying the modulating means in accordance with the rectifier current level; a monitoring device D.C. power supply having an input terminal and output terminal, its input terminal operably connected to the power line and its output terminal connected to the transmitter means, the monitoring means and the signal modulating means; receiver means disposed within the patrol vehicle for receiving the output of the transmitter means when the said patrol vehicle is in the near proximity of the rectifier, and audio output means operably connected to the receiver means for audibly indicating the cathodic protection rectifier status.

3,860,913

MULTIFREQUENCY SEQUENTIAL TONE DECODER

Walter Ole Weeks, Jr., and Thomas Stanley Wohnoutka, both of 8591 Flying Cloud Dr., Eden Prairie, Minn. 55343

Filed Apr. 13, 1973, Ser. No. 350,925
Int. Cl. H04q *1/45*
U.S. Cl. 340—171 PF **15 Claims**



1. A multifrequency sequential tone decoder adapted to be responsive to an input tone signal, comprising:

a. a frequency responsive bandpass filter adapted to be selectively responsive to an individual one of a plurality of frequencies, said frequency responsive bandpass filter including output means for providing a logic level output

in response to an input tone signal of said selected frequency;

b. sample position means responsive to said logic level output for providing a first test pulse after a predetermined period of time;

c. tone timing means **26** responsive to said logic level output for providing a reset signal when said logic level output fails to persist a predetermined period of time;

d. silence position means for providing after a predetermined period of time after the termination of said first test pulse a second test pulse;

e. silence timing means for providing a reset signal when said input tone signal exceeds a predetermined amplitude after a predetermined period of time measured from the termination of said first test pulse; and

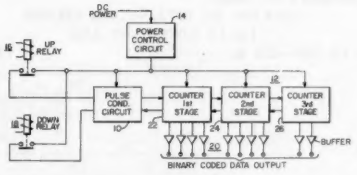
f. counter means operative in a first mode upon sequential termination of said first and second test pulses for effecting the switching of said frequency responsive bandpass filter to a second one of said plurality of frequencies and in a second mode in response to any one of said reset signals for switching said frequency responsive bandpass filter to a first one of said plurality of frequencies.

3,860,914

DIGITAL DATA RECORDER

William E. Zitelli, and Alan F. Mandel, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 8, 1973, Ser. No. 321,910
Int. Cl. G06f *1/00*
U.S. Cl. 340—172.5 **5 Claims**



1. A digital data recorder having an electronic counter responsive to a data input to provide a representative digital output exhibited by a plurality of bistable output bits, the counter including a plurality of toggle flip-flop output circuits corresponding to the plurality of output bits, each of said toggle flip-flops including a master and a slave stage with the corresponding output bit being provided by the slave stage, the master stage including a variable reactance within a feedback loop in the master stage, the value of the variable reactance being dependent upon the stable state of the output bit to control and vary a time constant of the feedback loop in a manner to re-establish the output bit last exhibited by the slave stage prior to a failure of supply voltage power to the counter after the supply power has been resumed.

3,860,915

MATRIX ARRANGEMENT FOR OPERATING OPTICAL ELEMENTS

Karl-Heinz Geier, 2, Strasse der Jargend; Dietmar Schmidt, Block 9, and Lothar Uhlmann, Block 37, all of Jena, Germany

Filed June 29, 1973, Ser. No. 375,305
Int. Cl. G11c *11/36, 11/42*
U.S. Cl. 340—173 LS **1 Claim**

1. "A two-dimensional matrix arrangement for operating optical elements, particularly for use in storages comprising

a *p*-type semiconductor layer,

an *n*-type semiconductor layer,

said *n*-type semiconductor layer being an epitaxial layer to said *p*-type semiconductor layer,

a *p*-type junction insulation in a frame like arrangement for matrix formation adapted to divide said *n*-type semiconductor layer into pairs of different sized areas,

each of said pairs being insulated from each other, said different sized areas being diffused in said *n*-type semiconductor layer,

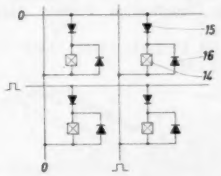
p-type areas, diffused in said pairs of different sized areas, said *p*-type areas having non-electrical connection to said *p*-type insulating frame,

said *p*-type areas, diffused in said pairs of different sized areas forming a pair of different sized diodes,

the pairs of different sized *p*-type areas being connected with each other through a conducting layer,

an insulating layer

for covering the layers and areas mentioned hereinbefore, with the exception of said *p*-type areas,



an optical element,

the properties of which being variable by an electromagnetical field applied,

a first terminal being formed by said insulating layer and being electrically connected to said optical element

a second terminal,

being electrically connected to said optical element and being transparent,

a plate being transparent and covering the entire matrix arrangement,

and further conducting layers,

being so arranged as to form columns and lines adapted to operate said optical element and for connecting the larger sized diode in parallel to said optical element,

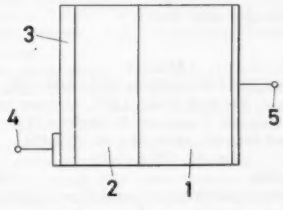
and the smaller sized diode in series to said optical element."

3,860,916

OPTICAL INFORMATION STORAGE DEVICE

Yasuo Tarui; Yoshio Komiya, and Tsunenori Sakamoto, all of Tokyo, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 30, 1973, Ser. No. 346,359
Claims priority, application Japan, Mar. 30, 1972, 47-31129
Int. Cl. G11c *11/42*
U.S. Cl. 340—173 LS **9 Claims**



1. An optical information storage and regeneration device comprising in combination, a semiconductor substrate, an insulating layer disposed on a main surface of said semiconductor substrate, a charge storage means inbedded in said insulating layer, a conductor layer insulated by said insulating

layers from said semiconductor substrate, stored electronic charges in said charge storage means of said insulating layer being changed by amounts of incident optical rays and amounts of a electrical signal applied between said conductor layer and parts of said semiconductor substrate, and a means for optically regenerating information which is represented by a plane distribution of said amount of stored electronic charges in said charge storage means, the output of said regenerated optical information being modulated according to said amount of electronic charges in said charge storage means.

3,860,917

OPTICAL MEMORY DEVICE FOR WRITING IN AND READING FOR INFORMATION

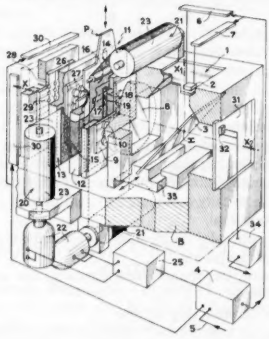
Luigi D. Auria, and Jean-Pierre Huignard, both of Paris, France, assignors to Thomas-CSF, Paris, France

Filed May 9, 1973, Ser. No. 358,545

Claims priority, application France, May 12, 1972, 72.16999

Int. Cl. G11c *11/42, 13/04*

U.S. Cl. 340—173 LM **10 Claims**



1. Optical memory device for writing in and reading-out information items consisting of M groups of N binary digits stored in a photosensitive support building up the data plane of said optical memory device, said device comprising: optical display means controlled by the information items pertaining to anyone of said groups for supplying a first pattern of optical data, multiple imaging means projecting onto said data plane M adjacent images of said first pattern arranged for forming a further pattern of M adjacent storage areas, shutter means for selectively limiting to anyone of said storage areas, the writing in of said informating items, photoelectric read-out means arranged in accordance with said first pattern, illuminating means arranged in accordance with said further pattern for selectively illuminating anyone of said storage areas, and optical reflecting means optically conjugating the sensitive face of said photoelectric read-out means with the emissive face of said optical display means.

3,860,918

CAPACITIVE POSITION TRANSDUCER

J. Arthur Cencel, Sherman Oaks, Calif., assignor to Becton, Dickinson Electronics Company, Rutherford, N.J.

Filed June 25, 1973, Ser. No. 373,494

Int. Cl. G08c *19/10*

U.S. Cl. 340—200 **15 Claims**

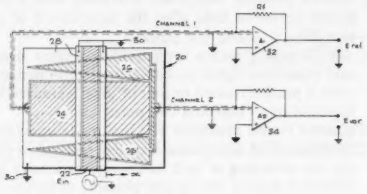
1. A capacitive position transducer system comprising:

a first, second and third spaced apart electrodes,

said first electrode of limiter area being positioned in a common surface, for relative movement in a predetermined direction with respect to said second and third electrodes and effectively spanning said second and third electrodes,

said second and third electrodes each having a predetermined area, being positioned in a second surface substantially parallel to said first surface,

exciter means connected to said first electrode for impressing a signal across said first electrods, said second and third electrodes each independently detecting a portion of said signal; and



circuit means coupled to said second and third electrodes and responsive to said detected portions of signals for presenting a first, reference output signal whose magnitude is unchanged in response to said relative movement and a second, variable output signal whose magnitude changes in response to said relative movement.

3,860,919

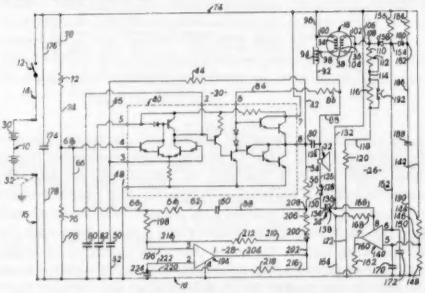
SMOKE AND GAS DETECTION AND ALARM APPARATUS

John L. Aker, Chanute, Kans., assignor to Donald E. Funck, Overland Park, Kans.

Filed Dec. 26, 1973, Ser. No. 428,094

Int. Cl. G08b *21/00, 3/00*

U.S. Cl. 340—237 R **12 Claims**



1. In electrical detection and alarm apparatus for sensing the presence of smoke, gas or the like and providing an audible warning thereof, which is adapted for operation with a limited permissible amount of continuous current drain from a supply source of direct current electrical power of predetermined voltage such as an electrical storage battery:

means for sensing the presence of smoke, unburned hydrocarbon gases or the like,

said sensing means requiring for operation thereof the application thereto of electrical energizing power of voltage substantially lower than the voltage of said supply source and of current drain substantially higher than said permissible amount,

said sensing means having sensing terminal means normally characterized by an electrical parameter of predetermined value therebetween, said parameter being changed to a different value when said sensing means detects the presence of smoke, unburned hydrocarbon gases or the like;

electrical oscillatory means, coupled with said direct current supply source and deriving operating power from the latter, for providing an alternating current output of

audio frequency and of voltage and current characteristics satisfying said energizing power requirements of said sensing means;

electrical circuit means for coupling said output of said oscillatory means with said sensing means for energizing the latter;

electrically responsive switching means having switched terminal means and control terminal means;

electrical circuit means for coupling said sensing terminal means of said sensing means with said control terminal means of said switching means for controlling switching operation of said switched terminal means of the latter responsive to the value of said parameter;

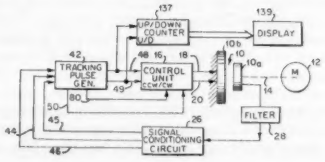
electrically responsive audio transducer means for providing an audio output when an input signal of audio frequency is applied thereto; and

electrical circuit means for coupling the output of said oscillatory means with said transducer means through said switches terminal means of said switching means.

3,860,920
POSITION-INDICATING SYSTEM

Robert W. Tripp, Tuckahoe, N.Y., assignor to Inductosyn Corporation, Valhalla, N.Y.

Filed June 20, 1973, Ser. No. 371,914
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 SY **6 Claims**



1. A system for indicating the displacement between relatively movable members of a data element of the type which provides an error signal having associated therewith a positive and negative sign in response to displacement signals representative of indicated displacements between said members which are respectively greater and lesser than the actual displacement therebetween, the amplitude of said error signal being representative of the difference between said indicated and actual displacements, comprising:

control means connected to an input of said data element for providing said displacement signals;

generating means connected to the output of said data element and the input of said control means for causing said displacement signals to change by a known increment in response to said error signal having an amplitude greater than a known amplitude;

digital modification means responsive to said error signal for generating logic signals, each said logic signal being generated upon a signal associated with said error signal remaining unchanged for a predetermined time;

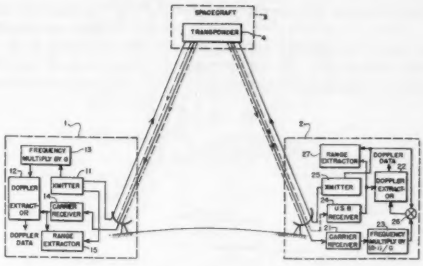
counter means for integrating said logic signals to generate a velocity signal representation of a computed velocity; and

pulse generator means connected to the input of said control means and responsive to said velocity signal representation for causing said displacement signals to change at a rate proportional to said computed velocity.

3,860,921
SIMULTANEOUS ACQUISITION OF TRACKING DATA FROM TWO STATIONS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of Gordon E. Wood, La Canada, Calif.

Filed Nov. 15, 1973, Ser. No. 416,135
Int. Cl. G01s *9/56*
U.S. Cl. 343—6.5 R **10 Claims**



1. A method for obtaining simultaneous tracking data from two ground stations relative to a spacecraft or aircraft carrying only one transponder, said stations transmitting independently at different stable frequencies spaced apart sufficiently to allow said transponder to track the frequency of a signal received from one station despite interference from the other station, interference of said transmitted signals produced a beat frequency signal at said transponder, said method comprising the steps of

tracking said transmitted signal from said one station in said transponder to produce a coherent reference signal,

transmitting a coherent carrier signal from said transponder to said ground station at a frequency that is a predetermined constant, G, times the frequency of said reference signal,

phase detecting the signals received by said transponder with said reference signal,

phase modulating said carrier signal transmitted by said transponder with the output signal of said phase detection, thereby providing a carrier signal with upper and lower sidebands,

acquiring said carrier signal and performing doppler extraction at said one station as a measure of craft velocity relative to said one station, and

acquiring one of said modulated sidebands and performing doppler extraction at said other station as a measure of craft velocity relative to said other station.

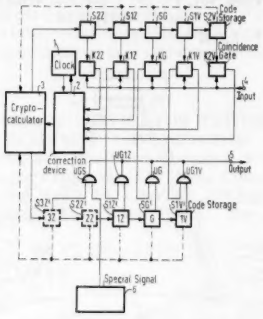
3,860,922
ANSWER DEVICE FOR AN INTERROGATION-ANSWER SYSTEM HAVING TIME DEPENDENT DIFFERING CODES AND PROVISION OF SPECIAL SIGNAL MEANS

Gerhard Wagner, 8154 Schaftlach, Weiherfeldstrasse 5, Germany

Continuation-in-part of Ser. No. 110,889, Jan. 29, 1971, abandoned. This application Feb. 9, 1973, Ser. No. 331,174
Int. Cl. G01s *9/56*
U.S. Cl. 343—6.8 LC **10 Claims**

1. A transponder of a secondary radar interrogation answer system comprising: means for receiving a programmed sequence of interrogation codes from an interrogation device, code means in said transponder for internally producing the programmed sequence of interrogation codes and a corresponding related programmed sequence of answer codes, said internally produced interrogation and answer codes each including past, present and future codes representing past, present and future time, means for comparing the internally produced interrogation codes with a received interrogation

code, means responsive to a coincidence between the received code and one of the internally produced interrogation codes, means for transmitting back to the interrogation station an answer code corresponding to the coincidence effected with one of said internally produced interrogation codes, first stor-



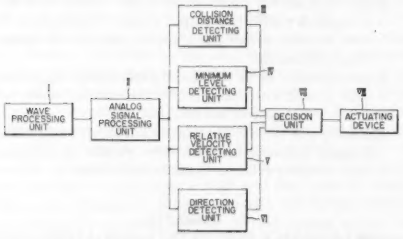
age means for storing an answer code corresponding to a future interrogation code and means for transmitting a future answer code to an interrogation device in place of an answer code normally effected in response to coincidence, as a special situation signal representing an emergency situation.

3,860,923

VEHICLE COLLISION ANTICIPATING DEVICE

Teruo Yamanaka, Seto; Takayuki Kato, Aichi-ken; Osamu Ozeki, Nagoya; Kazuo Sato, and Minoru Bito, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Toyota Chuo Kenkyusho, both of Aichi-ken, Japan

Filed Apr. 4, 1973, Ser. No. 347,804
Claims priority, application Japan, Apr. 8, 1972, 47-35338
Int. Cl. G01s *9/02*
U.S. Cl. 343—7 ED **13 Claims**



1. A vehicle collision anticipating device comprising

wave processing means for transmitting a wave by a transmitting antenna installed at a predetermined position and angle of a vehicle, for receiving a reflected wave from an object by a receiving antenna installed at a predetermined position and angle of the vehicle and for generating a low frequency wave by mixing said transmitted and reflected waves,

said receiving antenna being so installed that the beam axis of said receiving antenna may intersect that of said transmitting antenna in a predetermined range,

analog signal processing means connected to said wave processing means for signal processing said low frequency wave and at least one Doppler signal obtained from said low frequency wave, and for generating signals,

collision distance detecting means connected to said analog signal processing means for detecting a distance between the vehicle and object in response to the signals from said analog signal processing means, and for generating a signal when the object enters a predetermined distance range,

minimum level detecting means connected to said analog signal processing means for detecting an intensity of a Doppler signal obtained from said low frequency wave, and for generating a signal when said intensity of a Doppler signal reaches a predetermined minimum level so as to detect the object to enter a predetermined detection range determined by the positions and angles of the transmitting and receiving antennas, and

decisions means connected to said collision distance detecting means and minimum level detecting means for generating a signal in response to the simultaneous generation of signals by said collision distance detecting means and minimum level detecting means,

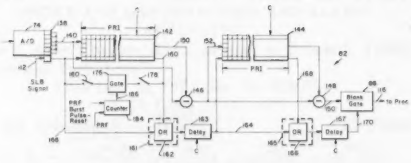
there by anticipating a collision of the object against the vehicle.

3,860,924

MOVING TARGET INDICATOR SYSTEM

Norol T. Evans, San Pedro, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 31, 1973, Ser. No. 394,888
Int. Cl. G01s *9/02, 9/42*
U.S. Cl. 343—7.7 **11 Claims**



1. A system for a main radar processing channel providing target signals over a plurality of pulse repetition intervals each having a plurality of range bins from a first to an Nth, comprising:

an auxiliary radar channel responsive to a multi-directional antenna,

comparator means responsive to said main radar channel and to said auxiliary radar channel to provide a blanking signal,

a predetermined number of canceller stages responsive to said target signal and each including target storage means for storing a plurality of target signal words with one for each range bin and for sequentially accessing the target signal for each range bin from a first to an Nth range bin, target storage means having input and outputs respectively representing the same range bin of different pulse repetition intervals, each canceller stage including subtracting means having inputs and an output with the inputs coupled to the input and the output of the target storage means of that stage, the output of said subtracting means, except for the last canceller stage, coupled to the input of the target storage means of the subsequent stage, blanking signal storage means associated with the target signal storage means for each range bin for each canceller stage, said blanking storage means each having an input and an output with said blanking storage means input for a first stage coupled to said comparator means,

gating means for each canceller stage coupled to the blanking storage means input and the blanking storage means output of that stage, with the output of each gating means, except for the last canceller stage, coupled to the blanking storage means input of the subsequent stage, and

a blanking gate coupled to the output of the subtracting means for the target storage means of the last canceller

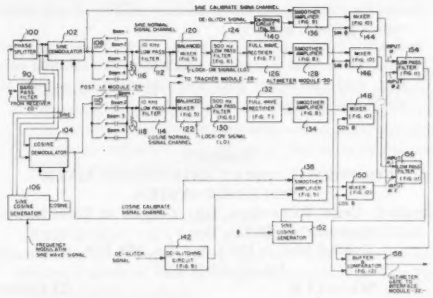
stage and coupled to said gating means for said last canceller stage for blanking predetermined target signals after reception of a blanking signal by said first canceller stage.

3,860,925

VELOCITY-ALTIMETER FREQUENCY-MODULATION CONTINUOUS-WAVE DOPPLER SYSTEM

Ernest F. Darboven, Jr., Oak Ridge, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Jan. 9, 1974, Ser. No. 431,904
Int. Cl. G01s 9/46
U.S. Cl. 343—9 **9 Claims**



1. In a frequency-modulated continuous-wave aircraft Doppler radar navigational system, which includes a transmitter for transmitting a frequency-modulated continuous-wave signal, and a receiver for receiving the corresponding Doppler-shifted frequency-modulated continuous-wave echo signal including a leakage component (J_1); the combination of: a post intermediate frequency circuit coupled to the receiving including sine-cosine demodulating means for eliminating the leakage component (J_1) and further including first and second filter means coupled to said demodulating means for rejecting the resulting zero speed leakage term;

a sine signal channel coupled to said first filter means and including a first rectifier for establishing a direct current analog of the demodulated sine signal from the demodulating means;

a cosine signal channel coupled to said second filter means and including a second rectifier for establishing a direct current analog of the demodulated cosine signal from the demodulator; and

output circuitry coupled to the first and second rectifiers for producing a gate signal having a duration which is a measure of the altitude of the aircraft.

3,860,926

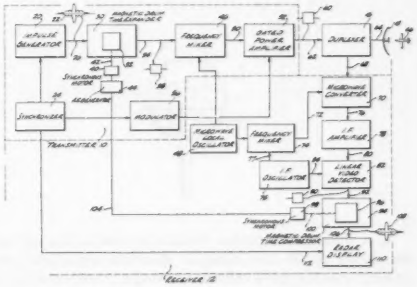
HIGH COMPRESSION RATIO PULSE FORMING SYSTEM

Arnold H. Gillmer, Inglewood, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 16, 1960, Ser. No. 29,542
Int. Cl. G01s 9/23
U.S. Cl. 343—17.2 PC **10 Claims**

1. A matched filter system comprising a first and a second magnetic drum continually rotating at a similar speed, a source of first narrow pulses including a plurality of frequency components, a first record head coupled to said source of narrow pulses and fixedly mounted adjacent to the surface of said first drum, a plurality of first read heads fixedly mounted adjacent to the surface of said first drum and evenly spaced around the circumference thereof, first erasing means including a first erase head fixedly mounted adjacent to the surface of said first drum, a plurality of first filters each coupled to a different one of said first read heads and having adjacent pass bands at different frequencies over a preselected frequency range, a first summing means coupled to said plurality of first filters for developing a wide pulse, a second record head coupled to said first summing means and fixedly mounted adjacent to the surface of said second drum, a plurality of second read heads fixedly mounted adjacent to the surface of said second drum, second erasing means including a second erase head fixedly mounted adjacent to the surface of said second drum, a plurality of second filters each coupled to a different one of said first read heads and having adjacent pass bands at different frequencies over said preselected frequency range, and a second summing means coupled to said plurality of said second filters for developing second narrow pulses similar to said first narrow pulses.

6. A ranging system for transmitting wide pulses toward an object in space and for intercepting the wide pulses after reflection from the object to develop narrow pulses compris-



ing an impulse generator for developing a narrow pulse including signal components of a plurality of frequencies, a first rotating magnetic drum, a first write head coupled to said impulse generator and fixedly mounted adjacent to the surface of said first drum for recording the signal components of said first narrow pulse thereon, a plurality of first read heads fixedly mounted adjacent to the surface of said first drum and evenly spaced around the circumference thereof, one of said first read heads being mounted adjacent to said first write head, a plurality of first filters each coupled to one of said plurality of first read heads and having pass bands centered at different frequencies so as to form a continuance sequence of pass bands over a preselected frequency range, said first filters coupled to said first read heads so that a different frequency is passed through during each portion of a cycle of rotation of said first drum equal to the reciprocal of the number of said first read heads, first summing means coupled to said plurality of first filters for developing a wide pulse including a signal having a frequency varying over said preselected range, transmitting means coupled to said first summing means for transmitting said wide pulses into space, receiving means for intercepting said wide pulses, a second rotating magnetic drum, driving means coupled to said first and second drums for rotating said drums at a similar velocity, a second write head coupled to said receiving means and fixedly mounted adjacent to the surface of said second drum for recording the signal of variable frequency thereon, said driving means developing a velocity such that the entire signal of variable frequency is recorded on the circumference of said second drum during one complete cycle of rotation, a plurality of second read heads fixedly mounted adjacent to the surface of said second drum and evenly spaced around the entire circumference thereof, one of said second read heads being adjacent to said second write head, a plurality of second filters each coupled to one of said plurality of second read heads and having pass bands centered at different frequencies so as to form a continuance sequence of pass bands over said preselected frequency range, said second filters coupled to said second read heads so that signals over said preselected range are passed through during a portion of the cycle of rotation equal to the reciprocal of the number of second read heads, second summing means coupled to said plurality of second filters for develop-

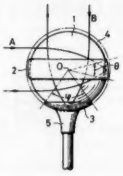
ing a second narrow pulse during said portion of the cycle of rotation of said second drum when signals are passed through said plurality of second filters, and display means coupled to said summing means for developing an indication of range with a high degree of resolution.

3,860,927

DIELECTRIC REFLECTOR FOR ELECTRIC WAVES

Hiroshi Ota, Tokyo, and Kazumi Mizutani, Kanagawa-ken, both of Japan, assignors to Kabushikikaisha Tokyo Keiki, Tokyo, Japan

Filed July 11, 1973, Ser. No. 378,376
Claims priority, application Japan, July 13, 1972, 47-70463
Int. Cl. H01q *15/14;* **343** *18 B*
U.S. Cl. 343—18 B **4 Claims**



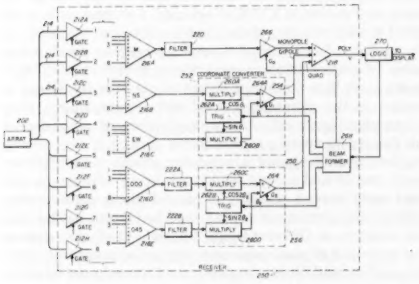
1. A dielectric reflector for electric waves for use with a life-saving outfit comprising a spherical dielectric lens, an annular electric wave reflector having a predetermined width and disposed on the spherical surface of the spherical dielectric lens at a position about a horizontal plane passing the central point of the spherical dielectric lens, a dish-shaped electric wave reflector having a predetermined area and disposed on the spherical surface of the spherical dielectric lens at a position about a vertical line passing through the central point of the spherical dielectric lens and extending downwardly thereof, a protective film of an electric wave transparent material covering the spherical dielectric lens together with the annular electric wave reflector and the dish-shaped electric wave reflector, and a support extending downwardly from the position of the dish-shaped electric wave reflector.

3,860,928

SUPER-DIRECTIVE SYSTEM

Stanley L. Ehrlich, Middletown, R.I., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 268,416, July 3, 1972, Pat. No. 3,821,740.
This application Nov. 1, 1973, Ser. No. 411,934
Int. Cl. H04b *7/04*
U.S. Cl. 343—100 SA **10 Claims**



1. In combination:

an array of radiating elements, said array having dimensions less than a wavelength of energy radiated therefrom;

a plurality of signal carrying channels;

means for coupling individual ones of said channels with respective ones of said radiating elements, each of said channels being coupled to all of said radiating elements to provide combinations of signals of said radiating elements, one of said channels having means for varying the gain of its signal combination relative to that of another of said channels, at least one of said combinations having at least a portion thereof which is the signal of a quadrupole radiation pattern, at least one of said combinations having at least a portion thereof which is the signal of a dipole radiation pattern and at least one of said combinations having at least a portion thereof which is the signal of a monopole radiation pattern;

means for rotating said dipole pattern relative to said quadrupole pattern; and

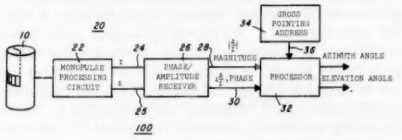
means for arithmetically combining each of said radiation patterns to form a multiple mode type of radiation pattern, said varying of gain and said rotating serving to shape said multiple mode pattern.

3,860,929

CONFORMAL ARRAY ANTENNA/RECEIVER PROCESSOR SYSTEM

Gerald E. Crain, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 7, 1973, Ser. No. 358,219
Int. Cl. G01s *3/22*
U.S. Cl. 343—113 R **23 Claims**



1. A monopluse receiver system for determining the direction to a target comprising:

a. a three dimensional antenna array for receiving complex azimuth monopulse sum and difference signals, Σ and Δ,

b. receiver means coupled to the array for producing the ratio of the magnitude of Σ and Δ, Δ/Σ , and the phase difference therebetween, Δ/Σ, and

c. process means coupled to said receiver means for estimating, responsive to monopulse return information, at least the azimuth to a target from a comparison with a predetermined tabulation of said functions Δ/Σ and Δ/Σ.

3,860,930

RADAR ANTENNA SCAN APPARATUS

Robert K. Peterson, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 23, 1973, Ser. No. 390,998
Int. Cl. H01q *1/28*
U.S. Cl. 343—705 **3 Claims**

1. A radar scan apparatus for translating a rotating antenna within a confined conical shaped space in an aircraft for increasing the size of the antenna aperture for an antenna system comprising:

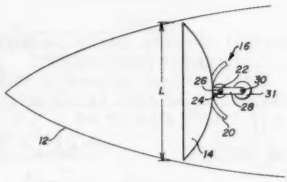
a. a drive shaft;

b. means coupled to the drive shaft for rotating the drive shaft;

c. a support means including a first support member attached to the drive shaft for rotation therewith, and a second support member rotatably mounted in said first support member, said second support member eccentrically disposed to the drive shaft;

d. an antenna attached to the second support member for rotation therewith; and

e. a drive means responsive to the rotation of the drive shaft for rotating the second support member and its antenna one half rotation in a direction opposite to that of the first support means for every rotation of the first support means whereby when said first support member is in the



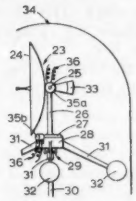
rearmost position the antenna extends with its maximum dimension perpendicular to the center line of the aircraft and moves the rotating antenna within a substantially triangular envelope to conform to the walls of the confined conical shaped space.

3,860,931

SHIP-BORNE GRAVITY STABILIZED ANTENNA

Donald Geoffrey Pope, Lilley Bottom, and Rodney John Kirkby, Chesham, both of England, assignors to The Post Office, London, England

Filed Nov. 26, 1973, Ser. No. 418,908
Int. Cl. H01q *1/34*
U.S. Cl. 343—709 **5 Claims**



1. A system for semi-stabilizing orientation of a directional receiving antenna of an antenna arrangement of a ship, wherein said system comprises: a structure having a mass of M kg and including said antenna balanced about a point fixed with respect to said structure; bearing means which define axes of rotation for said structure, which axes intersect at a pivotal center; and a radome covering said structure; said structure being, in use, gimbally mounted pendulously upon said ship by said bearing means with the center of gravity of said structure located below said pivotal center and spaced therefrom by a distance which, in meters, does not exceed 0.002 times the minimum value of the quotient I/M, where I kg m^2 is the moment of inertia of said structure about any of said axes, and said bearing means has a maximum total Coulomb friction torque about any of said axes which, in Newton-meters, is not greater than $0.00075 \times I$.

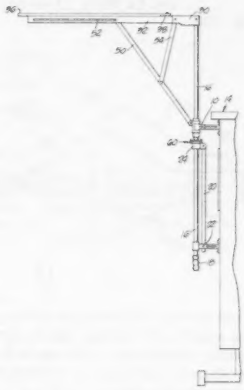
3,860,932

TELEVISION ANTENNA FOR MOTOR HOME WITH COLLAPSIBLE SUPPORT

Martin A. Hochbrueckner, P.O. Box 114 Canoga Park Annex, Canoga Park, Calif. 91305

Filed Feb. 1, 1974, Ser. No. 438,846
Int. Cl. H01q *1/32*
U.S. Cl. 343—713 **5 Claims**

1. A television antenna assembly for use in conjunction with a vehicle, such as a motor home, or the like, said assembly comprising: bracket means for mounting the assembly on the vehicle, said bracket means comprising a lower mounting bracket attached to the rear wall of the vehicle and an upper mounting bracket attached to the rear wall of the vehicle in vertical spaced relationship with respect to the lower mounting bracket; a vertically-extending pole slidably mounted in said bracket means; an elongated support bracket pivotally mounted to the upper end of said pole for angular movement in a vertical plane between a vertical angular position adjacent



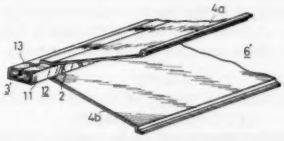
and parallel to the axis of the pole and a horizontal angular position essentially perpendicular to the axis of the pole; linkage means interconnecting said elongated support bracket and said upper bracket for turning said support bracket between its vertical and horizontal angular positions as said pole is moved vertically in the bracket means between a lower and an upper position; and antenna means mounted on said support bracket.

3,860,933

SLOT ANTENNA WITH FLARE

Takashige Terakawa, Kanagawa-ken, and Sadahiko Hidaka, Tokyo, both of Japan, assignors to Kabushikikaisha Tokyo Keiki, Tokyo, Japan

Filed Aug. 15, 1973, Ser. No. 388,425
Claims priority, application Japan, Aug. 18, 1972, 47-96601
Int. Cl. H01q *13/10*
U.S. Cl. 343—771 **1 Claim**



1. A slot antenna with a flare comprising a flare member having a first half section of antenna member formed as a unitary structure therewith, and a second half section of antenna member having formed therein slots, the first and second half sections of antenna member corresponding to that part having no slots and that part having the slots, respectively, which are obtained by dividing a slot antenna member having the slots in one of the walls of the shorter side of a waveguide of rectangular cross-section into two along a plane parallel with the walls of the shorter side of the waveguide and passing through the center of the walls of the longer side of the waveguide, and the second half section of antenna member being mechanically assembled with the first half section of

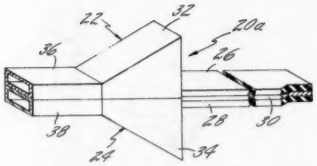
antenna member formed integrally with the flare member to provide the complete slot antenna member.

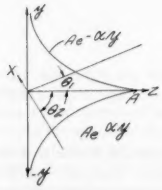
3,860,934

UNAMBIGUOUS PHASE INTERFEROMETER ANTENNA

Bernard Ru-Shao Cheo, Teaneck, N.J.; Lester H. Kosowsky, Stamford, Conn.; Peter W. Smith, and An-Hwa Soong, both of Westport, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Aug. 2, 1973, Ser. No. 385,205
Int. Cl. H01q *13/00*
U.S. Cl. 343—778 **5 Claims**





1. A phase interferometer antenna system comprising a pair of separately fed antennas disposed on opposite sides of a common reference plane in mirror image relationship with a substantially common boresight, each of said pair of antennas having an aperture normal to said reference plane, the aperture of each of said pair of antennas existing wholly on one respective side of said reference plane, the total aperture distribution of one of said antennas being substantially of the from of $Ae^{-\alpha y}$ and the total aperture distribution of the other of said antennas being substantially of the form of $Ae^{-\alpha y}$, where A is equal to the maximum amplitude of the aperture distribution, e is the Naperian operator, y is the distance to a point along the aperture from said reference plane, and α is an attenuation constant of the aperture distribution of each of said antennas, whereby each of said antenna is inpendently and differently phase sensitive to angle of incidence.

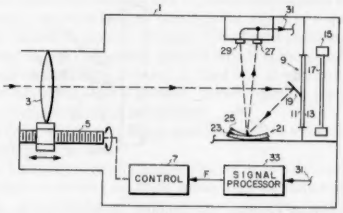
3,860,935

AUTO FOCUS CAMERA

Norman L. Stauffer, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 19, 1973, Ser. No. 426,194
Int. Cl. G03b *3/10*
U.S. Cl. 354—25 **16 Claims**

1. A camera means comprising:
means defining a plane for receiving a light sensitive film;
lens means for receiving light from an object to be photographed and forming a principal image of the object on the light sensitive film along a first light path;
shutter means disposed between said lens means and the light sensitive film, said shutter means being selectively operable to open and close thereby selectively exposing said light sensitive film to the light from said lens means;
first diversion means operable only when said shutter means is closed for reflecting said light from said lens means along a second light path;
second diversion means in said second light path for receiving said reflected light and forming a plurality of discretely identifiable portions of radiation from which first and second auxiliary images are formed;



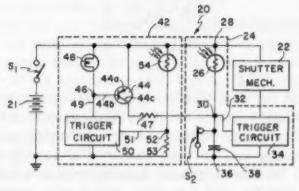
first and second sensing means arranged to sense the intensities of said first and second auxiliary images, respectively, and to provide difference signals representative of the difference in intensities therebetween, which intensities vary as a function of the condition of focus of the principal image, and
signal processing means connected to said first and second sensing means for providing an output signal indicative of the condition of focus of said principal image.

3,860,936

SHUTTER CONTROL CIRCUIT FOR CONTROLLING EXPOSURE TIME UNDER LOW LIGHT CONDITIONS

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 28, 1974, Ser. No. 437,109
Int. Cl. G03b *17/20, 7/08*
U.S. Cl. 354—51 **8 Claims**



1. In a camera having actuatable shutter means for regulating the amount of scene light projected toward a film exposure plane therein, a light sensitive control circuit for producing a shutter control signal having a time dependent parameter related to light intensity which determines the open time of said shutter means, and means responsive to said control signal for actuating said shutter means to terminate the film exposure interval when said time dependent parameter equals a predetermined value, improved exposure control apparatus for regulating said actuatable shutter means under low ambient light conditions comprising:
a. circuit means, including photosensitive means, adapted to switch between (1) a first state when ambient light intensity exceeds a predetermined level and (2) a second state when ambient light intensity is less than said predetermined level;
b. signal means connected to said circuit means for producing an indicator signal when said circuit means is in said second state, which indicator signal indicates ambient light is inadequate to effect a particular film exposure value within a predetermined exposure time; and

c. means responsive to the presence of said indicator signal for modifying said shutter control signal to increase said time dependent parameter thereof to indicate a light intensity greater than the intensity of ambient light whereby the shutter open time is reduced for time intervals greater than said predetermined exposure time.

3,860,937

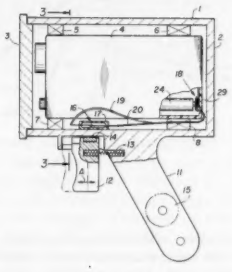
SUBMERSIBLE CAMERA HOUSING AND OPERATING MECHANISM THEREFOR

Clifford Wolfe, 67 Brook St., Islip, N.Y. 11751

Filed Dec. 13, 1973, Ser. No. 424,627

Int. Cl. G03b *17/08*

U.S. Cl. 354—64 **13 Claims**



1. A camera housing comprising:

means forming a sealed chamber and adapted to receive a battery operated camera therein, the camera having at least one battery terminal adapted to be electrically connected to a battery;

switching means inside said chamber in non-penetrating relationship with said housing and adapted to be connected in the electrical operating circuit of the camera for selectively opening and closing the electrical circuit of said camera to thereby selectively operate said camera, said switching means comprising:

isolating means directly connectable in the electrical operating circuit of the camera between the battery and said at least one battery terminal; and

a magnetically operated switch mounted on a wall of said chamber and coupled to said isolating means via flexible lead wires for selectively shorting out said isolating means to close the electrical circuit of said camera; and magnetic means located outside of said chamber and adapted to be located in selective magnetic communication with said magnetically operated switch, without physically penetrating through said chamber, to close said magnetically operated switch and short out said isolating means, thereby operating said camera, said magnetic means comprising:

a trigger member carring a permanent magnet adjacent an outer surface of said chamber, said trigger member being selectively operable to slide said permanent magnet along said outer surface of said chamber between a first "inoperative" position spaced in the direction of sliding movement thereof out of magnetic communication with said magnetically operated switch and a second "operative" position wherein said permanent magnet is located opposite from and in registration with said magnetically operated switch with a wall of said chamber interposed therebetween so as to be in magnetic communication with said magnetically operated switch to thereby close said magnetically operated switch; and

means biasing said trigger member toward said second "inoperative" position of said permanent magnet.

3,860,938

PHOTOGRAPHIC APPARATUS FOR USE WITH PERCUSSIVELY IGNITABLE FLASH LAMPS

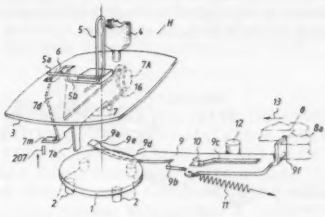
Siegfried Zobel; Rainer Spinnler, both of Munich; Gabriele Ehgartner, Pullach, and Fridolin Hennig, Munich, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 1, 1973, Ser. No. 384,399

Claims priority, application Germany, Aug. 4, 1972, 2238331

Int. Cl. G03b *15/04, 19/04*

U.S. Cl. 354—144 **19 Claims**



1. In a photographic apparatus for use with holders containing groups of percussively ignitable flash lamps and having for each lamp an indicator which respectively assumes a first and a second position when the corresponding flash lamp is respectively intact and fired, a combination comprising a supporting device arranged to detachably support a holder and being indexible between a plurality of angular positions to thereby move successive lamps of the holder thereon to an optimum positon for illumination of a subject; a film transporting device actuatable to transport the film lengthwise; motion transmitting means interposed between said devices and engaging said devices during indexing of said supporting device; and scanning means for tracking the indicator associated with that lamp of a holder on said supporting device which assumes said optimum position, said scanning means being movable between a first position which corresponds to the first position of the indicator for the lamp in said optimum position and in which said scanning means disengages said motion transmitting means from contact with at least one of said devices so that the actuation of said film transporting device does not result in indexing of said supporting device and said motion transmitting means does not move said supporting device, and a second position which corresponds to the second position of the indicator for the lamp in said optimum position and in which said motion transmitting means is free to index said supporting device in response to actuation of said film transporting device.

3,860,939

WIND-UP INTERLOCK FOR A SINGLE LENS REFLEX CAMERA

Naoyuki Uno, Saitama-ken, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Sept. 19, 1973, Ser. No. 398,697

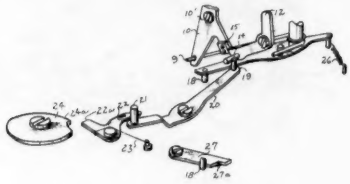
Claims priority, application Japan, Sept. 22, 1972, 47-110288

Int. Cl. G03b *17/42*

U.S. Cl. 354—153 **5 Claims**

1. In a single lens reflex camera having a shutter mechanism, a film winding mechanism that prior to triggering of a picture-taking operation in which the shutter mechanism is opened and closed provides for advancing film into position to be exposed, a mirror actuating member, and a diaphragm actuating member with each actuating member being movable between picture-composing and picture-taking positions, the combination comprising:

means for moving the actuating members through said positions in a cycle in the course of the picture-taking operation, said means including a driving member having a starting position at which prior to said triggering it is releasably stopped from moving and from which thereafter it is movable in a first direction to drive the actuating members from their picture-composing positions to their picture-taking positions, the driving member being movable in a second, opposite direction so as to return to the starting position upon completion of the return of the actuating members to their picture-composing positions; a multi-position member movable from first to second positions when the shutter mechanism is triggered, and biasing means acting against the multi-position member for urging it to return to the first position;



means on the multi-position member for releasably engaging the driving member while the multi-position member is in the first position so as to stop the driving member from moving until said triggering;

means on the driving member for releasably engaging the multi-position member while the multi-position member is in the second position so as to retain it there throughout the time the driving member is moving in the second direction and to release it upon completion of said return of the actuating members; and

means connected to the multi-position member for interlocking the film winding mechanism while the multi-position member is in the second position so that the film cannot be advanced until the completion of said return of the actuating members permits the multi-position member to be released and thereby be urged to return to the first position.

3,860,940

REFLEX CAMERA VIEWFINDER WITH IMAGE CORRECTING MEANS

James G. Baker, Winchester, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 264,933, June 21, 1972, Pat. No. 3,783,764. This application Dec. 19, 1973, Ser. No. 426,225

Int. Cl. G03b *19/12*

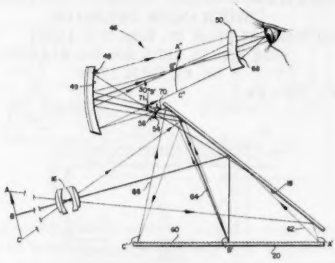
U.S. Cl. 354—155 **31 Claims**

24. A camera comprising:

an objective lens;

an eye lens; and

means defining an optical path between said objective lens and said eye lens, said optical path defining means including a reflective focusing screen positioned at a focal plane of said objective lens, a first mirror disposed to first reflect a primary real image formed by said objective lens onto said reflective focusing screen and to subsequently reflect light emanating from said primary image on said reflective focusing screen, said light emanating obliquely from said reflective focusing screen, an aspheric concave mirror for forming a rectified real image of said reflective focusing screen using said light wherein the shape and the arrangement of said aspheric concave mirror introduces field tilt into said rectified real image and said shape of said aspheric concave mirror causes CACF in said rectified real image, an aperture stop disposed between said first mirror and said aspheric concave mirror to transmit said light, a correcting plate disposed proximate said aperture stop, said eye lens arranged to form a magnified virtual image of said rectified real image, a first aspheric



refracting surface, situate on said eye lens, for minimizing said field tilt otherwise associated with said magnified virtual image, and a second aspheric refracting surface, situate on said correcting plate, for reducing said CACF otherwise associated with said magnified virtual image.

3,860,941

MIRROR SHOCK ABSORBING DEVICE FOR SINGLE LENS REFLEX CAMERA

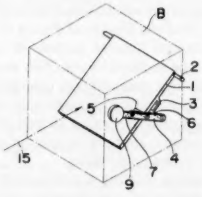
Susumu Fukuda, Hyogo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa-ken, Japan

Filed Aug. 15, 1973, Ser. No. 388,711

Claims priority, application Japan, Aug. 15, 1972, 47-081956

Int. Cl. G03b *19/12*

U.S. Cl. 354—156 **3 Claims**



1. In a single lens reflex camera having a case and a mirror pivotably attached within said case, an improved mirror shock absorbing device comprising:

a. a lever pivotably attached to said case within said case at its approximate mid-point,

b. a pin attached to a first end of said lever, said pin engaging said mirror,

c. a member having a first end attached to a second end of said lever, and

d. a counterweight rigidly affixed to a second end of said member.

3,860,942
CONTAINER FOR PHOTOGRAPHIC ROLL FILM

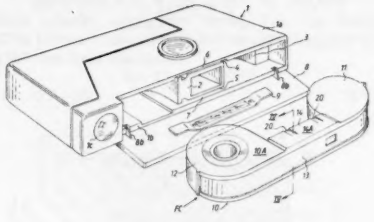
Fridolin Hennig, Munich, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 22, 1974, Ser. No. 435,422

Claims priority, application Germany, Jan. 24, 1973, 2303269

Int. Cl. G03g *19/04*

U.S. Cl. 354—275 **11 Claims**



1. A container for a supply of photographic roll film for use in photographic apparatus of the type having a chamber for reception of the container and bounded by a plurality of internal surfaces, said container comprising a casing including a first section for the storage of unexposed film and a second section for the storage of exposed film whereby a portion of said supply of film extends between said sections and is located in a predetermined plane, said casing further having an exposed surface which is at least substantially normal to said plane and said container further comprising at least one elastic portion arranged to engage and to be deformed by one of said internal surfaces of a photographic apparatus whose chamber receives said container and to thereby urge said exposed surface against another of said internal surfaces.

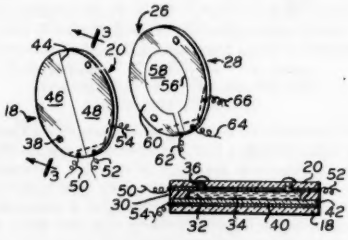
3,860,943
ELECTROOPTICAL-CALIBRATED VARIABLE NEUTRAL DENSITY FILTER WITH SPLIT AREA CONTROL

Patrick W. Tague, 33 W. 75th St., New York, N.Y. 10001

Filed May 15, 1973, Ser. No. 360,495

Int. Cl. G03b *11/00*

U.S. Cl. 354—295 **10 Claims**



1. A variable neutral density optical filter with split area control comprising first and second transparent plates, means holding said plates spaced from one another and defining a chamber therebetween,

an electrically conductive coating on the facing faces of said plates defining said chamber, the electrically conductive coating on at least one of said faces being sub-divided into at least two independent areas, and the electric conductive coating on the other of said faces constitutes at least one independent area a plurality of electrical conductors each connected with a respective independent area of said plates,

a fluid containing elongated dipole particles disposed within said chamber, and

variable current means for independently establishing a variable potential from each independent area of one plate to the other plate across the fluid-containing chamber thereby to cause said dipole particles to align themselves perpendicularly to said plates, the extent of alignment and the amount of light passing through the plates being dependent upon the potential, the independence of said areas permitting the amount of light passing through said areas to be independently controlled.

3,860,944
APPARATUS FOR THE FLUID TREATMENT OF PHOTOGRAPHIC SHEET MATERIAL WHEREIN THE LATTER IS PASSED ALONG AN ARRAY OF ROLLERS

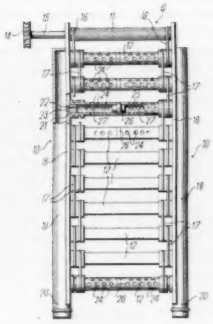
Norbert Huber, Oberaichen; Siegfried Nissler, Echterdingen, and Hans Schneider, Leinfelden, all of Germany, assignors to Firma Autopan Heimerdinger & Stabler OHG, Oberaichen/Wurtt., Germany

Filed Apr. 5, 1973, Ser. No. 348,188

Claims priority, application Germany, Apr. 7, 1972, 167711; Apr. 28, 1972, 162266; July 21, 1972, 357604; Sept. 8, 1972, 440717

Int. Cl. G03d *3/02*

U.S. Cl. 354—324 **23 Claims**



1. An apparatus for the treatment of photographic materials, comprising:

a housing;

roller means defining a transport path for a photographic material having a sensitive face and a reverse face;

means forming at least one open-work surface engageable with said reverse face of the photographic material and displaceable to entrain said photographic material along said path;

means for treating said sensitive face with a fluid and including fluid-displacement means having an intake side communicating with said housing on the side of said path opposite said sensitive face and a discharge side communicating with the interior of said surface outwardly of the sensitive face of photographic material disposed thereon, said means forming said surface being the surface of said roller means, said roller means comprising a plurality of tubular rollers spaced apart along said path and provided with radial bores opening at the surfaces of said rollers, said intake side of said fluid-displacement means communicating with the interiors of said rollers; and

a support frame receivable in said housing and having a pair of uprights carrying said rollers, at least one of said up-

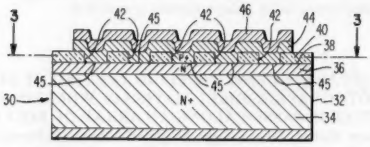
rights being hollow and forming a duct connecting the interiors of said rollers with said intake side of said fluid-displacement means.

3,860,945

HIGH FREQUENCY VOLTAGE-VARIABLE CAPACITOR

Robert Herman Dawson, Ithaca, N.Y., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 29, 1973, Ser. No. 346,192
Int. Cl. H01l 5/06
U.S. Cl. 357—14 **7 Claims**



1. A voltage variable capacitor structure comprising:

a body of semiconductive material of one type conductivity having a surface,

a layer of dielectric material on said surface, said layer of dielectric material having an opening therein exposing a portion of said surface of said body, and

a layer of material on said layer of dielectric material, adapted to make rectifying contact with said semiconductive material and having a portion thereof disposed in said opening to define with said body a rectifying junction at the surface of said body, the area of said layer adapted to make rectifying contact with said semiconductive material being large relative to the area of said portion thereof, wherein said body of semiconductive material comprises an epitaxial layer having said one type conductivity disposed on a substrate of semiconductive material having said one type conductivity, said substrate containing conductivity modifiers in an amount of at least 4×10^{20} atoms per cubic centimeter, and said epitaxial layer having a thickness between about one and about two micrometers.

3,860,946

SPACE-CHARGE-LIMITED SOLID-STATE TRIODE

Alex Shumka, La Canada, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Oct. 13, 1972, Ser. No. 297,436
Int. Cl. H01l 29/78
U.S. Cl. 357—22 **10 Claims**

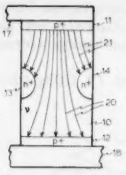
1. A space-charge-limited solid-state triode comprising:

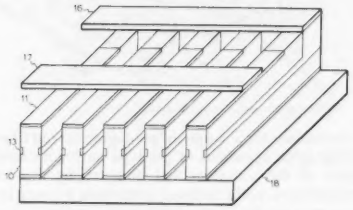
a filament of semiconductor of near-intrinsic material, said filament having a substantially rectangular cross section, an emitter region of a selected type of conductivity, said region being formed with a high concentration of impurities distributed along one narrow side of said filament,

a collector region of the same type of conductivity as said emitter region, said collector region being formed with a high concentration of impurities distributed along a narrow side of said filament opposite said one narrow side, separate ohmic contacts made to said emitter and collector regions,

gate regions of a conductivity type opposite said one type, said gate regions being formed with high concentration of impurities distributed in narrow strips extending longitudinally along the midsections of both wide sides of said filament,

ohmic contacts made to said gate regions, and





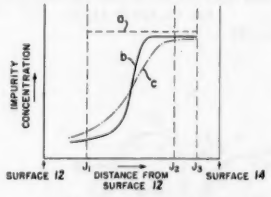
means for connecting said gate contacts together to form a single control electrode.

3,860,947

THYRISTOR WITH GOLD DOPING PROFILE

Hiroshi Gamo, and Akira Kawakami, both of Itami, Japan

Continuation of Ser. No. 125,243, March 17, 1971, abandoned. This application Nov. 2, 1973, Ser. No. 412,271
Claims priority, application Japan, Mar. 19, 1970, 45-23342
Int. Cl. H01l 11/10
U.S. Cl. 357—38 **12 Claims**



1. A semiconductor switching device comprising a semiconductor wafer including four semiconductor regions disposed in such a relationship that each of said four semiconductor regions exhibits a different conductivity type from those of adjacent ones, wherein one central region is composed of a material having a higher resistivity than the other central region and both having therebetween a first junction centrally positioned of three PN junctions formed between said four semiconductor regions and a second junction positioned on one of the ends of said three PN junctions, and wherein said semiconductor wafer includes therein impurities for controlling the lifetime of carriers injected therein during use of the device, and wherein the impurity concentration of the portion of said central region adjacent to said first junction has a value greater than 1.2 times that of the impurity concentration of the portion of the central region adjacent to said second junction.

3,860,948

METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICES HAVING OXIDE FILMS AND THE SEMICONDUCTOR DEVICES MANUFACTURED THEREBY

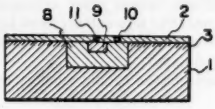
Minoru Ono; Toshimitsu Momoi, and Youji Kawachi, all of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 71,810, Sept. 14, 1970, , which is a division of Ser. No. 431,677, Feb. 10, 1965, Pat. No. 3,643,137. This application Nov. 8, 1972, Ser. No. 304,668

Claims priority, application Japan, Feb. 13, 1964, 39-7388The portion of the term of this patent subsequent to Feb. 24, 1987, has been disclaimed.

Int. Cl. H01l *3/12*

U.S. Cl. 357—60 8 Claims



1. A semiconductor device comprising:
a silicon crystalline body of a given conductivity type having a substantially plane major surface lying substantially parallel to a 100 crystal plane;
a silicon oxide film covering said major surface and having a tendency to induce surface donors in said major surface of said body contiguous therewith, the surface density of surface donors induced in said major surface of said body by the existence of said film being not more than 3.5×10^{11} electrons/cm^2; and
electrode means operatively connected to the combination of said silicon crystal body and said oxide film.

2. A semiconductor device comprising:
a silicon crystalline body of a given conductivity type having a substantially plane major surface lying substantially parallel to a 110 crystal plane;
a silicon oxide film covering said major surface and having a tendency to induce surface donors in said major surface of said body contiguous therewith, the surface density of surface donors induced in said major surface of said body by the existence of said film being not more than 5×10^{11} electrons/cm^2.

3,860,949

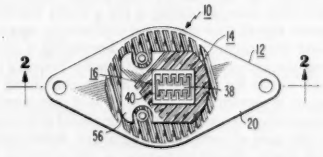
SEMICONDUCTOR MOUNTING DEVICES MADE BY SOLDERING FLAT SURFACES TO EACH OTHER

Alvin John Stoeckert, Sommerville, and James Martin Hunt, Belle Mead, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sept. 12, 1973, Ser. No. 396,565

Int. Cl. H01l *3/00, 5/00*

U.S. Cl. 357—65 4 Claims



1. In a semiconductor device wherein a first flat surface of a semiconductor chip is joined to a second flat surface of a metal by a fusible bonding material, the improvement comprising:
a plurality of non-intersecting grooves in said second flat surface adjacent said semiconductor chip and extending beyond the periphery thereof,
said grooves being substantially parallel to each other,
each of said grooves having a depth of between about 1 and 3 mils, and
said grooves being spaced between about 10 and 40 mils from each other.

3,860,950

METHOD AND APPARATUS FOR RECORDING AND READING OUT HOLOGRAMS ON BLACK-AND-WHITE FILM

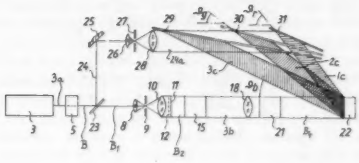
Richard Wick, Munich, and Friedrich Bestenreiner, Grunwalt, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 28, 1972, Ser. No. 221,672

Claims priority, application Germany, Jan. 29, 1971, 2104277

Int. Cl. H04m *9/02*; G02b *27/00*

U.S. Cl. 358—2 17 Claims



1. A method of producing of sequence of holograms of original film frames on photosensitive material comprising the step of placing discrete frames of original material comprising a color film in which a plurality of colors are superimposed in each of said frames into register with at least one linear color grating, directing a first portion of a first beam of coherent light having a plurality of wavelengths against said discrete frame, modulating said first portion of said first beam by said grating and said frames, thereby producing a second beam, and utilizing said modulated second beam in conjunction with a second portion of said first beam to form a hologram on a photosensitive material.

3,860,951

VIDEO TRANSDUCING APPARATUS

Marvin Camras, 560 Lincoln Ave., Glencoe, Ill. 60022

Division of Ser. No. 34,504, May 4, 1970, Pat. No. 3,705,954. This application Sept. 20, 1971, Ser. No. 182,228

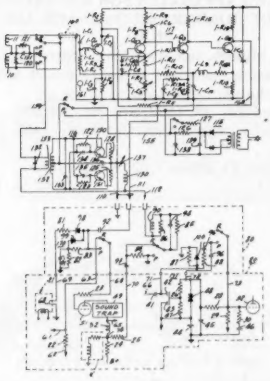
Int. Cl. H04n *9/02*

U.S. Cl. 358—4 17 Claims

16. In a transducing system including a broadcast television receiver having a television signal circuit along which a television signal is transmitted when the receiver is tuned to a broadcast television signal, a video transducer device including a video magnetic transducer head, and coupling means for coupling the television signal circuit of said receiver with said video magnetic transducer head of said video transducer device during a playback transducing operation,
said video transducer device including a video playback circuit having an input for coupling with said video magnetic transducer head during playback transducing operation and having an output,
said coupling means comprising adapter circuitry including a pair of conductors leading from open circuit points of the television signal circuit of the television receiver such that received broadcast television signals are transmitted via one of said pair of conductors from the television signal circuit to the adapter circuitry, the other of said pair of conductors being operable to transmit video sig-

nals to said television signal circuit for display by the broadcast television receiver, and

adapter switch means connected with said adapter circuitry for selectively conditioning said coupling means for a playback transducing operation and connected with said pair of conductors and with said output, and being shiftable between a broadcast reception mode and a playback mode, said adapter switch means being operable in said broadcast reception mode to connect said one of said pair



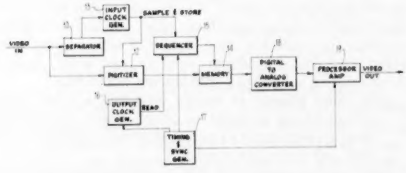
of conductors to the other of said pair of conductors to establish continuity between said open circuit points of said television signal circuit, and said adapter switch means in said playback mode being operable to interrupt continuity between said pair of conductors to prevent display of a received broadcast television signal, and to connect said output of said video playback circuit with said other of said pair of conductors for display of a video signal reproduced from a magnetic record by means of said video magnetic transducer head.

3,860,952

VIDEO TIME BASE CORRECTOR

Michael W. Tallent, San Jose; Lee E. Scaggs, Mountain View; Allan L. Swain, Palo Alto; Ronnie M. Harrison, San Jose, and William B. Hendershot, III, San Jose, all of Calif., assignors to Consolidated Video Systems, Inc., Santa Clara, Calif.

Filed July 23, 1973, Ser. No. 381,463
Int. Cl. H04n *5/76, 9/02*
U.S. Cl. 358—8 **45 Claims**



1. A system for removing time base errors from video type information signals comprising:

input means adapted to be coupled to said information signals;

an input clock generator coupled to said input means for generating input clock reference signals having a variable rate dependent upon said time base errors in said information signals;

means for sampling said information signals at a rate determined by said input clock reference signals, said sampling means having a control input coupled to said input clock generator;

memory means coupled to said sampling means for temporarily storing said sampled signals at a rate determined by said input clock reference signals;

an output clock generator for generating output clock reference signals having a standard rate;

sequencer means for controlling the application of said input and said output clock reference signals to said memory means to sequentially store said sampled signals at said variable rate and fetch said store signals at said standard rate; and

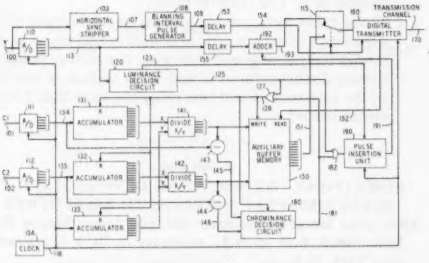
output means coupled to said memory means.

3,860,953

METHOD AND APPARATUS FOR ENCODING COLOR VIDEO SIGNALS

Cassius Chapin Cutler, Holmdel; John Ormond Limb, New Shrewsbury, and Charles Benjamin Rubinstein, Colts Neck, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 26, 1973, Ser. No. 373,634
Int. Cl. H04n
U.S. Cl. 358—13 **13 Claims**



1. Apparatus for encoding at least one chrominance signal which provides color information for a scene represented by a luminance signal, said apparatus comprising means responsive to said chrominance signal for developing a value which represents the chrominance signal, means responsive to said luminance signal for developing a first energizing signal in response to a significant change in said luminance signal, means responsive to said chrominance signal and to said value representing said chrominance signal for developing second energizing signal, means responsive to the presence of either said first or said second energizing signals for coupling said value representing the chrominance signal to a transmission channel, and means responsive to the presence of said second energizing signal and the absence of said first energizing signal for changing said luminance signal before said luminance signal is coupled to the transmission channel.

3,860,954

COLOR SYNCHRONIZATION CONTROL CIRCUIT WITH GENERATION OF COLOR KILLER SIGNAL

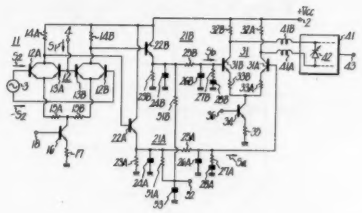
Takao Tsuchiya, Kanagawa-ken, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 131,204, April 6, 1971, abandoned. This application Jan. 15, 1973, Ser. No. 323,473

Claims priority, application Japan, Apr. 7, 1970, 45-29688; Apr. 7, 1970, 45-33572

Int. Cl. H04n 9/46, 9/48

U.S. Cl. 358—25 **4 Claims**



1. A color synchronization control for color television receivers comprising means comprising an oscillator for generating a reference sub-carrier signal for demodulation of a color television signal; a first differential amplifier comprising first and second amplifier transistors and differential input terminals to receive a color synchronization signal contained in the color television signal each of said transistors comprising an emitter-collector circuit; switching means connected to said oscillator to receive a switching signal therefrom and comprising third and fourth transistors, each comprising an emitter-collector circuit connected in parallel with the emitter-collector circuits of said first and second transistors respectively, to cause said amplifier to be intermittently operative, for producing first and second output signals related to the phase difference between a part of the output of said oscillator and said synchronizing signal, said first and second detected output signals being of opposite phase to each other; first peak detector means for producing a first direct voltage output in response to the peak voltage value of the first output signal of said differential amplifier; a second peak detector means for producing a second direct voltage output signal of said differential amplifier; means for producing a third direct voltage output in proportion to the voltage difference between said first and second direct voltage outputs; and means for applying said third direct voltage output to said oscillator to control it in synchronism with the color synchronizing signal.

3,860,955

COLOR IMAGE PICKUP DEVICE

Takashi Shinozaki, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama City, Kanagawa-ken, Japan

Filed Apr. 25, 1973, Ser. No. 354,327

Claims priority, application Japan, Apr. 28, 1972, 47-42941

Int. Cl. H04n 9/06

U.S. Cl. 358—44 **3 Claims**

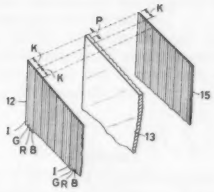
1. A color image pickup device comprising:

a pickup tube having an image-forming surface at its front face;

a multi-lenticular lens disposed at a specific distance in front of the image-forming surface and comprising a plurality of cylindrical lens elements arranged transversely in side-by-side positions with a predetermined pitch P, the cylindrical lens elements facing the image-forming surface;

a color-resolving stripe filter disposed at a specific distance in front of the lenticular lens and comprising a plurality of groups of filter elements, each group comprising a plurality of filter elements respectively passing light of different wavelengths and disposed successively in a predetermined sequence, which is repeated in all other groups, each group having a predetermined transverse width K which is two times the predetermined pitch P; and

an objective lens disposed in front of the color-resolving stripe filter and between said filter and an object to be picked up;



the lenticular lens and the color-resolving stripe filter being so arranged and adapted that a first distance between a principal plane at which light rays passing through the focal points of the lenticular lens change their paths of advance to become parallel to the optical axis within the lenticular lens and the surface of the color-resolving stripe filter facing the lenticular lens is equal to a second distance between a plane passing through the optical centers of all lens elements of the lenticular lens and the image-forming surface.

3,860,956

COLOR TARGET AND METHOD OF MANUFACTURING SAME

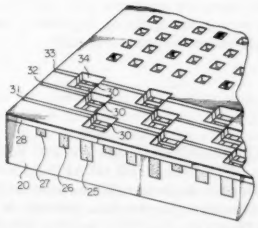
Shuji Kubo, and Tohru Itoh, both of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 16, 1973, Ser. No. 341,896

Claims priority, application Japan, Mar. 17, 1972, 47-27762; Nov. 10, 1972, 47-113361

Int. Cl. H04n 9/06

U.S. Cl. 358—48 **10 Claims**

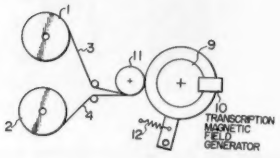


1. A semiconductive photoelectric converting device comprising a semiconductive substrate of one conductivity type having a light-receiving surface, a plurality of separate first p-n junctions juxtaposed in said substrate at a predetermined depth from said surface, and a plurality of separate second p-n junctions equal in number as said first p-n junctions and spaced therefrom at different depths from said surface corresponding to the red, green and blue components respectively of light incident on said surface.

3,860,957
MAGNETIC TAPE DUPLICATING APPARATUS

Kaoru Imanishi, Neyagawa, and Hisayoshi Inoue, Kyoto, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sept. 17, 1973, Ser. No. 397,729
Claims priority, application Japan, Sept. 21, 1972, 47-95362; Dec. 29, 1972, 47-4440; Dec. 29, 1972, 47-4442
Int. Cl. G11b *5/86*
U.S. Cl. 360—17 **7 Claims**



1. A VTR magnetic tape duplicating apparatus for duplicating audio and video signals comprising a master tape supply reel on which a recorded master tape is wound; an unrecorded slave tape supply reel on which an unrecorded slave tape is wound, both said master and slave tapes being provided with leader tapes at their leading end portions which have widths and thicknesses different than the magnetic tape portions of their respective tapes; a take-up reel for winding up said tapes with their magnetic surfaces in contact with each other, no magnetic field being applied to said tapes when said tapes are wound on said take-up reel; means for rewinding both tapes wound on said take-up reel onto the respective supply reels at the same speed, said means including guide means for guiding both of said tapes with their magnetic surfaces in contact with each other over their predetermined travel path at least when both of said tapes are rewound from said take-up reel; and duplicating means for applying duplicating energy to both tapes in said predetermined travel path.

3,860,958
OFFSET READ/WRITE MAGNETIC RECORDING SYSTEM WITH GUARD BAND

Charles C. Hanson, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 27, 1973, Ser. No. 336,391
Int. Cl. G11b *5/02, 5/46*
U.S. Cl. 360—57 **5 Claims**

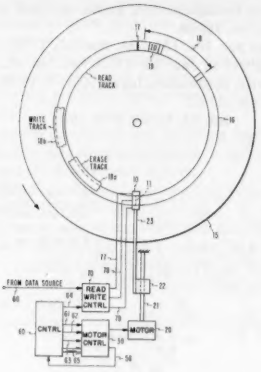
1. A method for controlling the operation of a single gap magnetic transducer for reading and writing data in tracks on magnetic media comprising the steps of:

positioning said transducer off-set to one side of the nominal track position on said magnetic media to overlie a portion of said nominal track and a portion adjacent thereto;

energizing said transducer in said off-set to one side position to erase data from said magnetic media;

positioning said transducer off-set to the other side of said nominal track position, and

energizing said transducer in said off-set to the other side

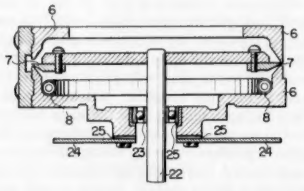


position to write data on said magnetic media partly within said nominal track and partly adjacent thereto.

3,860,959
MAGNETIC RECORDING AND REPRODUCING APPARATUS WITH HEATED TAPE GUIDE

Yoku Kudou, Katano, Japan, assigner to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed June 18, 1973, Ser. No. 370,709
Claims priority, application Japan, June 19, 1972, 47-61635; July 3, 1972, 47-66812
Int. Cl. G11b *15/60, 15/34*
U.S. Cl. 360—84 **5 Claims**



1. In a magnetic recording and reproducing apparatus of the helical scan type having magnetic type guide means including a lower drum having a guide surface for guiding a magnetic tape upwardly along its periphery,

a shaft rotatably mounted in a concentric relation on the magnetic tape guide surface of said lower drum,

an upper drum having a guide surface for guiding the magnetic tape downwardly along its periphery and located in a concentric relation to said lower drum to define a predetermined gap therebetween, and

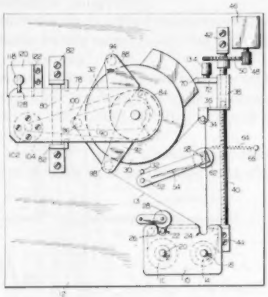
at least one rotary head mounted on said shaft with its leading edge projecting into the gap defined between said upper and lower drums, wherein the magnetic tape travels while it is wrapped around said guide means over at least **180** degrees thereof whereby a slant magnetization pattern can be recorded on the magnetic tape when said rotary head is rotated;

the improvement comprising heating means for heating at least one side of the magnetic tape guide surfaces of said upper and lower drums in order to vaporize water content attracted to contact surfaces between said upper and lower drums and the magnetic tape to reduce friction resistance between said drum and the magnetic tape.

3,860,960
MAGNETIC RECORDING AND REPRODUCING APPARATUS WITH TAPE EXTRACTION

Takenori Akamine, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Claims priority, application Japan, Sept. 21, 1971, 46-73588
Filed Sept. 13, 1972, Ser. No. 288,545
Int. Cl. G11b *15/66, 23/04*
U.S. Cl. 360—85 **8 Claims**



1. A magnetic recording and reproducing apparatus comprising:

a guide drum including a magnetic head;

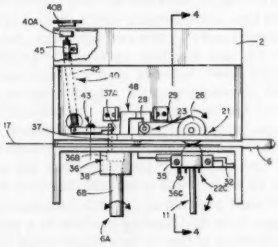
take-out means for taking a tape out of an opening of a cartridge into a narrow loop; spreading means for spreading said narrow loop of the tape into a wide loop; and

tape guiding means including at least one tape guide pin which is inserted into the wide loop of the tape, and guide pin moving means on which said pin is mounted and movable around said guide drum to guide the tape into contact with and to hold it against a portion of the periphery of the guide drum, whereby said tape guide pin serves as a guide for positioning the tape in a predetermined path while the tape is moving along said guide drum.

3,860,961
CARD ADAPTER FOR TAPE RECORDER

Charles R. Budrose, 127 Country Club Rd., Melrose, Mass.

Filed July 20, 1972, Ser. No. 273,441
Int. Cl. G11b *5/00*
U.S. Cl. 360—88 **32 Claims**



1. A device for use with an audio recording-reproducing machine having means defining a cassette receiving station, a transducer head and tape drive means;

said device for enabling said machine to handle a card having at least one track of magnetic recording medium thereon and comprising:

a base member received at said cassette receiving station,

means on said base member defining a guide channel for said card to pass along including a bottom wall having a card resting surface for holding an edge of the card and being disposed above the transducer head of the recording-reproducing machine,

and means coupling from the tape drive means of said recording-reproducing machine for moving said card along said channel,

said means defining a guide channel being configured to provide operative access for said transducer means to said card and for said card moving means to said card,

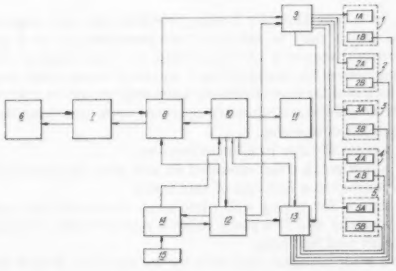
said means defining a guide channel including a pair of spaced upstanding walls one of which provides access for the transducer means and the other of which provides access for the card moving means,

and including means extending through openings in said walls below said transducer means for holding said card moving means at one end thereof and said transducer means at the other end thereof.

3,860,962
MAGNETIC TAPE REPRODUCING APPARATUS

Julian Baker, Llantrisant, Glamorgan, Wales, assignor to Rosemarie Ann Baker; Barrie William Cooper; Doreen Christine Cooper and Richard L. Aubrey, part interest to each

Filed Mar. 28, 1972, Ser. No. 238,809
Claims priority, application Great Britain, Apr. 1, 1971, 08477/71
Int. Cl. G11b *21/08, 5/00*
U.S. Cl. 360—92 **24 Claims**

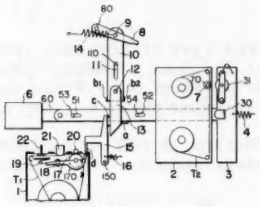


1. Apparatus for reproducing a recording selected from a plurality of recordings on magnetic tape, including a plurality of tape decks each for reproducing a respective magnetic tape bearing a plurality of recordings on separate tracks, a selector unit by which a user can register a recording selected for reproduction, a search unit operatively connected to the selector unit for performing a scanning operation and providing an indication of the location of a recording selected for reproduction and registered in the selector unit, a deck selecting unit having an operative connection with a motor of each tape deck, such deck selecting unit being responsive to the indication provided by the search unit and acting to select for operation the motor of the tape deck which has the magnetic tape bearing the recording to be reproduced, and a track selecting unit having an operative connection with a reproducing head of each tape deck, such track selecting unit being responsive to the indication provided by the search unit and acting to set the reproducing head of the tape deck selected for operation so as to achieve reproduction of the track corresponding to the selected recording.

3,860,963
PLURAL TAPE RECORDER CHANGE-OVER MECHANISM FOR SIMULTANEOUS OR SEQUENTIAL OPERATION

Tateki Ueda, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 14, 1973, Ser. No. 340,987
Claims priority, application Japan, Mar. 21, 1972, 47-32375[U]
Int. Cl. G11b *15/68, 5/54*
U.S. Cl. 360—92 3 Claims



1. In a tape recorder having provision for two magnetic tapes which may be operated independently or in a predetermined sequence or relationship, the improvement comprising means for changing back and forth from a first mode in which said tapes are operated upon sequentially to a second mode in which said tapes are operated upon simultaneously, said means comprising:

a. a plate slidable in a linear manner;

b. a first pinch roller mounted on said plate in spaced relationship to a first one of said tapes;

c. means for urging said plate away from said first tape, whereby said first pinch roller is not normally in contact with said first tape;

d. a lever manually operable by the operator of said tape recorder;

e. a bar pivotably connected to said lever at one end of said bar;

f. a pawl pivotably connected to the other end of said bar;

g. means for urging said lever into either a first position or a second position;

h. a stop mounted on said plate and adapted to engage said pawl when said lever is in said first position but not when said lever is in said second position;

i. means for limiting the arc in which said pawl can pivot;

j. a second pinch roller pivotably mounted and normally urged into contact with the second of said tapes;

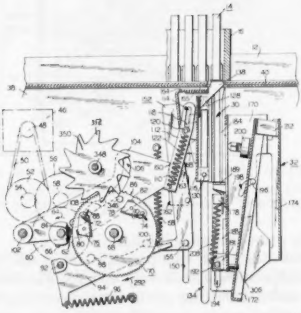
k. a pivotably mounted crank lever, one end of which engages the free end of said pawl and another end of which is in spaced relationship to said second pinch roller, whereby said second pinch roller may be pivoted out of contact with said second tape by a movement of said pawl, which movement is in turn caused by the movement of said stop when said lever is in its first position; and

l. means for sliding said plate in a linear manner whereby said first pinch roller is brought into contact with said first tape and, if said lever is in its first position but not if said lever is in its second position, said stop causes said pawl to pivot, thereby causing said second pinch roller to be pivoted out of contact with said second tape.

3,860,964
TAPE CARTRIDGE CHANGER

Isao Kozu, and Hidetoshi Kurihara, both of Osaka-fu, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 15, 1968, Ser. No. 729,233
Claims priority, application Japan, May 16, 1967, 42-31662
Int. Cl. G11b *5/00, 23/04*
U.S. Cl. 360—92 17 Claims



1. A combination tape deck and tape cartridge changer comprising: a chassis, a tray for receiving a plurality of cartridges, each having a magnetic tape therein, said tray being movably mounted on the upper side of said chassis; a tape deck which includes tape moving means for moving said tape at a predetermined speed, and at least one magnetic head for recording and/or playback of said tape, tape deck mounting means on the lower side of said chassis in which said tape deck is mounted for movement into and out of engagement with a tape cartridge when the cartridge is in an operative position, said chasses having an insertion opening therein between said tray and said tape deck through which each of said cartridges can pass between said tray and said tape deck; guide means on said chassis on said insertion opening for guiding said cartridges up and down between said tray and said tape deck through said insertion opening; tray driving means engaged with said tray for driving said tray intermittently to convey said cartridges successively to a loading position corresponding to said insertion opening; and cartridge exchanging means operatively associated with said tape deck and guide means including an elevator which is movable between a raised position and a lowest position and which successively translates said cartridges from said loading position to a predetermined inoperative position in face to face relationship with said tape deck and which returns each of said cartridges from said inoperative position to said loading position under guidance of said guide means, cartridge shifting means for shifting said cartridges from said inoperative position to an operative position, and projecting means on said tape deck projecting into the path of movement of said cartridges from the inoperative to the operative position and engaged by said cartridges for moving said tape deck toward the operative position of said tape cartridge for engaging said tape moving means of said tape deck with the tape cartridges and the magnetic head with the magnetic tape in the cartridges.

3,860,965

MAGNETORESISTIVE READ HEAD ASSEMBLY HAVING MATCHED ELEMENTS FOR COMMON MODE REJECTION

Otto Voegeli, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 4, 1973, Ser. No. 403,704

Int. Cl. G11b 5/30

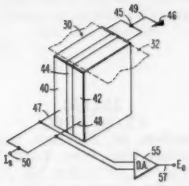
U.S. Cl. 360—113 6 Claims

1. A magnetic read head assembly for sensing magnetically recorded information comprising:

two magnetostatically coupled magnetoresistive elements, said elements having substantially the same thickness and magnetic properties;

insulating means disposed between said elements for breaking the magnetic exchange coupling between said elements, and for electrically isolating one element from the other element;

means for supplying a drive current concurrently to said elements so that the current through each element serves to magnetically bias the other of said elements, said elements being biased in opposite directions; and



signal output means connected to said elements, including means for sensing the difference in voltage of the elements.

DESIGNS

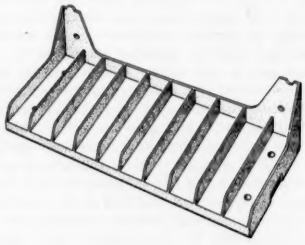
JANUARY 14, 1975

234,063
CLOG BOOT
Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc., New York, N.Y.
Filed Mar. 7, 1973, Ser. No. 338,874
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—275

234,064
CHAIR
Akihiko Noda and Akira Hirose, Tokyo, Japan, assignors to France Bed Co., Ltd., Tokyo, Japan
Filed Feb. 28, 1973, Ser. No. 336,485
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—70

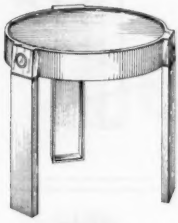
234,065
CHAIR
Kunio Onoguchi, Tokyo, Japan, assignor to France Bed Co., Ltd., Tokyo, Japan
Filed Feb. 28, 1973, Ser. No. 336,527
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—76

234,066
TAPE CARTRIDGE RACK
Robert S. Wallace, Los Angeles, Calif., assignor to Simpac International Inc., Los Angeles, Calif.
Filed June 11, 1973, Ser. No. 369,005
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—85

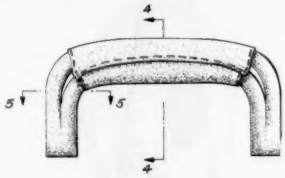


234,067
DISPLAY DEVICE FOR ELECTRIC DRY CELLS OR THE LIKE
Daniel W. Leo, 322 S. Merrick Ave., Merrick, N.Y. 11566
Filed Dec. 8, 1972, Ser. No. 313,548
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—148

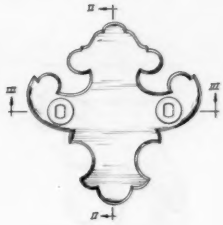
234,068
TABLE
Manus Mudde, Berkel-Enschot, Netherlands, assignor to Dart Industries, Inc., doing business as The West Bend Company, West Bend, Wis.
Filed Jan. 22, 1973, Ser. No. 325,923
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—176



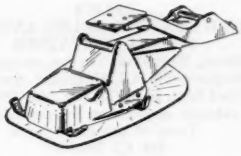
234,069
LUGGAGE HANDLE
Bela G. Szabo, 105 Park Road, Rosslyn Farms, Carnegie, Pa. 15106
Filed Nov. 15, 1972, Ser. No. 306,747
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—154



234,070
BACKPLATE FOR DRAWER PULLS OR THE LIKE
William Doyle Watt, Jr., Grand Rapids, Mich., assignor to Keeler Brass Company, Grand Rapids, Mich.
Filed July 30, 1973, Ser. No. 384,124
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—179



234,071
DENTAL CHAIR BASE
Dwight A. Booth, 7906 SE. 13th Ave., Portland, Oreg. 97202
Filed Feb. 15, 1973, Ser. No. 332,606
Term of patent 14 years
Int. Cl. D6—*06, 01*
U.S. Cl. D6—194

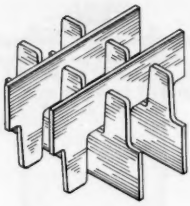


234,072
WALL BRACKET FOR HOLDING A DISPENSING CONTAINER OR THE LIKE
Donald Schultz, Rowayton, Conn., assignor to Richardson-Merrell Inc., New York, N.Y.
Filed Aug. 8, 1973, Ser. No. 386,606
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—233

234,073
UTILITY POLE GUY HOOK
Joseph W. Dimiceli, 417 Eccles Ave., South San Francisco, Calif. 94080
Continuation of abandoned design application Ser. No. 273,058, July 1, 1972. This application Nov. 14, 1973, Ser. No. 415,587
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—260

234,074
COMBINED SHAVING BRUSH AND SHAVING CREAM CONTAINER
Ingmar Nilsson, Halmstad, Sweden, assignor to Inilsson Saljkompani AB, Halmstad, Sweden
Filed Sept. 18, 1972, Ser. No. 289,940
Claims priority, application Sweden Mar. 24, 1972
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—8

234,075
CARTON PARTITION UNIT
Hile A. Clark, Kirkwood, Mo., assignor to Olinkraft, Inc.
Filed July 14, 1972, Ser. No. 271,917
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—99

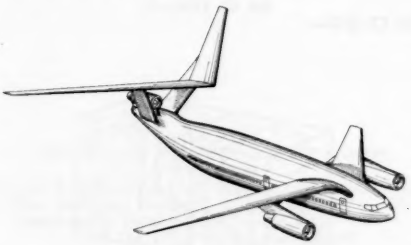


234,076
BOTTLE
Ronald A. Peterson, Scarsdale, N.Y., assignor to Richardson-Merrell Inc., New York, N.Y.
Filed May 30, 1973, Ser. No. 365,187
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—143

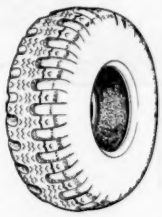
234,077
BOTTLE
Ronald A. Peterson, Scarsdale, N.Y., assignor to Richardson-Merrell Inc., New York, N.Y.
Filed May 30, 1973, Ser. No. 365,169
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—149

234,078
MOBILE COLD FOOD SERVER
Roy Emanuele, Massapequa, N.Y., assignor to Institutional Maintenance Corp., Brooklyn, N.Y.
Filed Jan. 10, 1972, Ser. No. 216,885
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—22

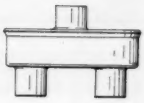
234,079
TANDEM WING AIRPLANE
Philip C. Whitener, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Aug. 9, 1973, Ser. No. 387,216
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—77



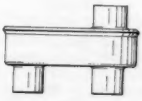
234,080
TIRE
Louis Marick, Grosse Pointe Farms, Mich., assignor to the United States of America as represented by the Secretary of the Army
Filed Dec. 12, 1972, Ser. No. 314,300
Term of patent 14 years
The term of this patent subsequent to Oct. 31, 1986, has been disclaimed
Int. Cl. D12—*15*
U.S. Cl. D12—148



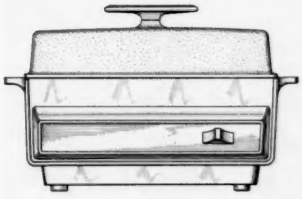
234,081
OUTLET BRAZE ASSEMBLY FOR AUTOMOTIVE AIR CONDITIONING SYSTEMS
Arthur S. Kish, Lyndhurst, Ohio, assignor to Murray Corporation, Cockeysville, Md.
Filed Apr. 23, 1973, Ser. No. 353,473
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—43



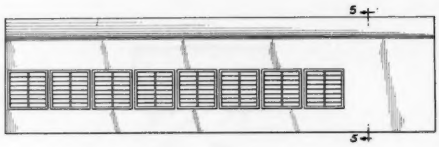
234,082
OUTLET BRAZE ASSEMBLY FOR AUTOMOTIVE AIR CONDITIONING SYSTEMS
Arthur S. Kish, Lyndhurst, Ohio, assignor to Murray Corporation, Cockeysville, Md.
Filed Apr. 23, 1973, Ser. No. 353,605
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—43



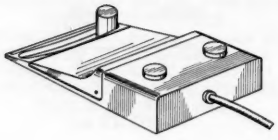
234,083
TOWEL HEATING APPLIANCE
Edward J. Doyle, Hatboro, and Robert S. Waters, Lancaster, Pa., assignors to Schick Incorporated, Lancaster, Pa.
Filed Oct. 9, 1973, Ser. No. 404,488
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D23—77



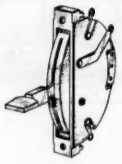
234,084
COMBINED VENTILATION FAN BANK AND LIGHT BAFFLE FOR POULTRY BUILDING
George E. France, Rte. 2, Box 60, Oswego, Ill. 60543
Filed May 8, 1972, Ser. No. 251,603
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—140



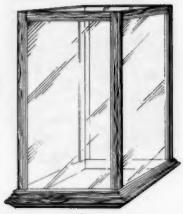
234,085
FOOT OPERATED DEVICE FOR ACTUATING DENTAL INSTRUMENTS
Reinhard Straihammer, Kirschhausen, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany
Filed Nov. 10, 1972, Ser. No. 305,609
Claims priority, application Germany June 26, 1972
Term of patent 14 years
Int. Cl. D24—*01;* D13—*03*
U.S. Cl. D24—1 B



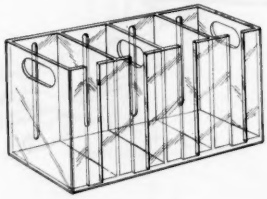
234,086
VARIABLE RESISTOR
Mamoru Matsumoto, Toyonaka, Shunzo Oka, Hirakata, and Akitoshi Miyashita, Suita, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 8, 1972, Ser. No. 233,010
Claims priority, application Japan Sept. 10, 1971
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 D



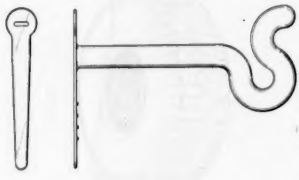
234,087
AQUARIUM
Boyd R. Johnson, 2034 Ashton Circle, Salt Lake City, Utah 84109
Filed Oct. 18, 1972, Ser. No. 298,687
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—8



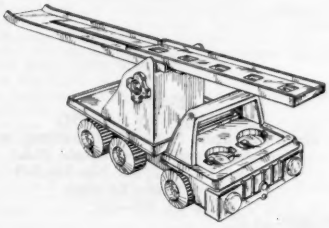
234,088
CULTURE FLASK HOLDER
Robert R. Granados, Mahopac, N.Y., assignor to Boyce Thompson Institute for Plant Research, Inc.
Filed Aug. 22, 1972, Ser. No. 282,770
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D32—1



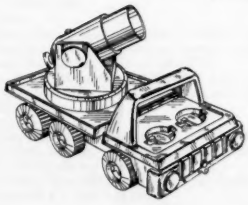
234,089
CRIB TOY MOBILE
Jorma Vennola, Princeton, N.J., assignor to Columbia Broadcasting System, Inc.
Filed Feb. 16, 1973, Ser. No. 333,354
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 J



234,090
TOY TRUCK WITH MOVABLE RAMP OR THE LIKE
Jerrold J. Krumholz, West Orange, and Herbert Happe Van Reisgen, Westfield, N.J., assignors to Victor Comptometer Corporation, Chicago, Ill.
Filed Jan. 22, 1973, Ser. No. 325,662
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ

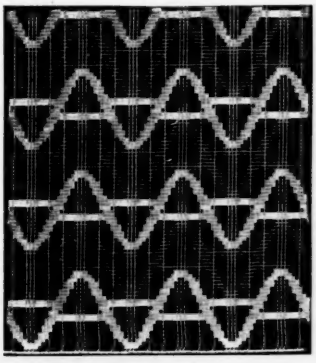


234,091
TOY TRUCK WITH MOVABLE CANNON OR THE LIKE
Jerrold J. Krumholz, West Orange, and Herbert Happe Van Reisgen, Westfield, N.J., assignors to Victor Comptometer Corporation, Chicago, Ill.
Filed Jan. 22, 1973, Ser. No. 325,665
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ

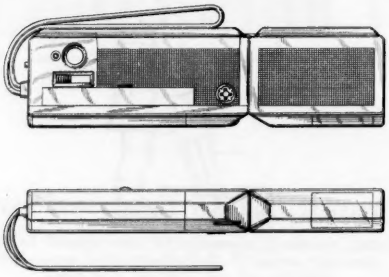


234,092
DOLL TOY
Norman Spiegel, 200 5th Ave., New York, N.Y. 10010
Filed July 5, 1973, Ser. No. 376,822
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AD

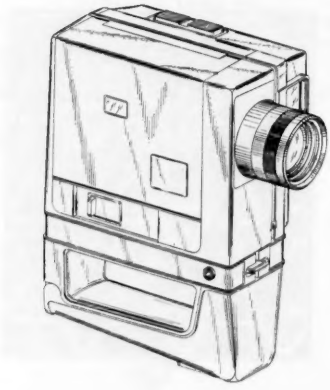
234,093
CURTAIN FABRIC
Peter E. Schroeder, Am Falter 8, Oberwil, near Bremgarten, Switzerland
Filed Aug. 10, 1973, Ser. No. 387,466
Claims priority, application Germany Feb. 13, 1973
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D92—1 PP



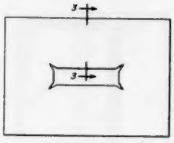
234,094
COMBINED CAMERA AND FLASH UNIT
Karl-Heinz Lange, Bunde, Germany, assignor to Balda-Werke Photographische Gerate GmbH & Co. KG, Bunde, Germany
Filed Mar. 5, 1973, Ser. No. 337,978
Claims priority, application Germany Sept. 22, 1972
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D61—1 B



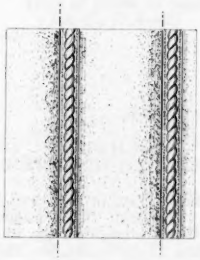
234,095
MOTION PICTURE CAMERA OR THE LIKE
David Elwood Hansen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 3, 1972, Ser. No. 294,710
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D61—1 C



234,096
DECORATIVE VEGETATION INHIBITING SURROUND FOR GRAVE MARKING STRUCTURES
Joseph J. Matvey, 1100 Penn Center Blvd.—615, Pittsburgh, Pa. 15235
Filed Feb. 11, 1972, Ser. No. 225,704
Term of patent 14 years
Int. Cl. D31
U.S. Cl. D79—2



234,097
UPHOLSTERY FABRIC
Hugh C. Dugan, Nutley, N.J., assignor to Carlee Corporation, Northvale, N.J.
Filed Apr. 14, 1972, Ser. No. 244,349
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D87—3 G



234,098
COMBINATION TIMBER CRUISING AND RANGE POLE
Sam Coumbs, 2604 N. Lee, Spokane, Wash. 99207
Filed Mar. 12, 1973, Ser. No. 340,580
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D88—1

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TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF JANUARY, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Schmidt, Paul Herman; and Spencer, Edward Guerrant, 3,860,783.

Bellbanks, Inc.: *See—*
Banks, Donald D., 3,860,050.

Belock, Robert J.: *See—*
Calder, Brooke J., Jr.; Risko, Bernard L.; and Belock, Robert J., 3,860,677.

Benckiser-Knapsack GmbH: *See—*
Kling, Alfred; Specht, Viktor; Hofstetter, Carmen; and Eisenberg, Gundolf, 3,860,391.

Bendall, Dennis M., to Xerox Corporation. Copying machine. 3,860,339, Cl. 355-14.000.

Bendix Corporation, The: *See—*
Knockeart, Ronald P.; and Wilkinson, John R., 3,860,794.
Strukel, Marlene R., 3,860,805.
Watson, Edwin Ben; and Fuller, Harlan I., 3,859,972.

Benedict, Manson; Thompson, William I.; and Parrish, Robert L., to United States of America, Atomic Energy Commission. Cold trap system for recovering condensable gas from a vessel to be evacuated. 3,859,807, Cl. 62-55.500.

Benedict, Manson, to United States of America, Scientific Research and Development Office for Emergency Mangagment. Cold trap for purging air from a gas diffusion system. 3,859,808, Cl. 62-55.500.

Benelli, Giovanni, to Benelli S.p.A. Divisione Armi. Hunting gun with floating bolt provided with a device for locking the bolt head in the bolt breech upon firing. 3,859,745, Cl. 42-16.000.

Benelli S.p.A. Divisione Armi: *See—*
Benelli, Giovanni, 3,859,745.

Benner-Nawman, Inc.: *See—*
Nawman, Rollie B., 3,860,212.

Bennett, Frank L.: *See—*
Black, Thomas J.; and Bennett, Frank L., 3,860,017.

Benson, Robert A., to Submarine Engineering Associates, Inc. Submersible oil boom. 3,859,796, Cl. 61-1.00F.

Bentley, Allen J.; and Goyal, Ashok K., to Ford Motor Company. Flexible bladed fan. 3,860,362, Cl. 416-132.000.

Bentley, Floyd Edward, to Jefferson Chemical Company, Inc. Selective manufacture of 4,4'-isomer of diaminodiphenyl-methane. 3,860,637, Cl. 260-570.00D.

Bentzen, Bruce D.: *See—*
Anderson, Lawrence; and Bentzen, Bruce D., 3,860,005.

Benz, Hans, to Brown Boveri-Sulzer Turbomachinery Ltd. Mounting arrangement for an adjusting cylinder in an axial compressor. 3,860,356, Cl. 415-150.000.

Benzmiller, Thomas G. Cable-driven transmission for free stall barn cleaners. 3,860,109, Cl. 198-224.000.

Berardinelli, John D.; and Goulart, Paul R., to said Berardinelli, by said Goulart. Handbag holder. 3,860,210, Cl. 248-308.000.

Berardinelli, John D.: *See—*
Berardinelli, John D.; and Goulart, Paul R. (assors. to said Berardinelli, by said Goulart), 3,860,210.

Berger, Alfred: *See—*
Abel, Heinz; Hostettler, Hans; Berger, Alfred; Toepfl, Rosemarie; and Maeder, Arthur, 3,860,540.

Berger, Paul C., to FLUXO. Melting furnace. 3,860,223, Cl. 266-33.00R.

Bergfeld, Manfred: *See—*
Zengel, Hans Georg; and Bergfeld, Manfred, 3,860,641.

Bergman, Walter George, to Walter George Enterprises, Inc. Point of purchase display and storage rack. 3,860,305, Cl. 312-114.000.

Berkoff, Charles E.; Di Tullio, Nicholas W.; and Weisbach, Jerry A., to SmithKline Corporation. Methods and pharmaceutical compositions for inhibiting gluconeogenesis. 3,860,716, Cl. 424-266.000.

Bernander, Karl-Gustav; and Keller, Herbert, to AB Strangbetong. Method of producing a prestressed concrete member. 3,860,687, Cl. 264-228.000.

Bernin, Victor Maurice, to Illinois Tool Works Inc. Magnetically operated electronic gain control. 3,860,883, Cl. 330-29.000.

Besserdich, Orrin H.; and Crawford, Donald C., to FMC Corporation. Method of and apparatus for stacking flexible articles. 3,859,898, Cl. 93-93.00M.

Bessier, Robert D.: *See—*
Kinslow, William G., Jr.; Marchant, Paul A.; Bessier, Robert D.; and Hafele, Robert X., 3,860,375.

Bestenreiner, Friedrich: *See—*
Wick, Richard; and Bestenreiner, Friedrich, 3,860,950.

Bethlehem Steel Corporation: *See—*
Platner, James B.; and Schaefer, Charles M., III, 3,859,802.
Shoemaker, Carlyle E., 3,860,438.
Speros, Gregory, 3,859,836.
Weiskopf, Daniel A., 3,860,099.

Betz Laboratories, Inc.: *See—*
Shema, Bernard F.; Brink, Robert H., Jr.; and Swered, Paul, 3,860,516.
Shema, Bernard F.; and Brink, Robert H., Jr., 3,860,517.
Shema, Bernard F.; Brink, Robert H., Jr.; and Swered, Paul, 3,860,713.

Bianchi, Nereo, to Necchi S.p.A. Fabric feeding device for sewing machines. 3,859,936, Cl. 112-76.000.

Bibbens, William H. Seals and methods and means of sealing for rotary engines and the like. 3,860,365, Cl. 418-61.00A.

Bieganski, Zdzislaw. Hand operated tools. 3,859,875, Cl. 81-52.40R.

Bieth, Andre Jean; Jeru, Henri Jean-Marie; and Bakker, Bernard Roger Pierre, to Chantiers Navals de la Ciotat Etablissement du Trait. Apparatus for homogenizing particulate material. 3,860,129, Cl. 214-16.00R.

Binard, William J.; and Dye, John F., to Kendall Company, The. Catheter with safety deflation means. 3,860,007, Cl. 128-349.00B.

Binard, William J.: *See—*
Dye, John F.; Binard, William J.; and Anglada, Leonard R., 3,859,854.

Bingham, Alan Edgar, to Vosper Thornycroft Limited. Gas cushion vehicle. 3,860,084, Cl. 180-117.000.

Binsfeld, George H.: *See—*
Westerlund, Robert E.; Westerlund, Herbert A.; and Binsfeld, George H., 3,860,175.

Biomechanics, Inc.: *See—*
Somerset, James H., 3,860,826.

Bionic Industries Limited: *See—*
Aapro, Aarno, 3,860,832.

Bitner, Daniel G. Operating table accessory. 3,859,993, Cl. 128-132.00R.

Bito, Minoru: *See—*
Yamanaka, Teruo; Kato, Takayuki; Ozeki, Osamu; Sato, Kazuo; and Bito, Minoru, 3,860,923.

Bjorksten, Johan: *See—*
Schenk, Roy U.; and Bjorksten, Johan, 3,860,485.

Black, Thomas J.; and Bennett, Frank L., to Universal Machine Company, Inc. Coin circulating feed conveyor. 3,860,017, Cl. 133-1.00R.

Blanco, Louis A.; and Meade, Hazel W., to Commercial Decal, Inc. Ceramic decalcomania. 3,860,471, Cl. 156-89.000.

Blick Equipment Corporation: *See—*
Weholt, Raymond L., 3,859,934.

Blocker, Truman G.: *See—*
McQuiddy, David N., Jr.; and Blocker, Truman G., 3,860,879.

Blue, Walter L., to Herbethon Toy Corporation. Rotatable toy. 3,859,748, Cl. 46-47.000.

Blume, Roe Calvin, to du Pont de Nemours, E. I., and Company. 2,4-Dimethyl-3 methylene-1,4-pentadiene and polymer. 3,860,669, Cl. 260-677.00R.

Bocklemann, John B.: *See—*
Strandskov, Frede B.; and Bocklemann, John B., 3,860,729.

Boeing Company, The: *See—*
Emanuel, Carl F., deceased, 3,860,487.
Simpson, Robert D., 3,860,800.

Bogie, Nelson H. Jaw-type crusher. 3,860,183, Cl. 241-217.000.

Bolick, Fred C., Jr., to Lanier Electronic Laboratories, Inc. Web storage apparatus. 3,860,190, Cl. 242-68.500.

Boliden Aktiebolag: *See—*
Gorling, Karl Goran; and Wiklund, Johan Elof, 3,860,413.

Bolton, Ronald L. Sanitary storage cabinet. 3,860,304, Cl. 312-71.000.

Bonaddio, Robert M.; and Parkhill, Laverne O., to PPG Industries, Inc. Apparatus for ganged scoring of glass. 3,859,878, Cl. 83-8.000.

Borg-Warner Corporation: *See—*
Clauss, Julius A., Jr., 3,859,872.

Borner, Gerhard: *See—*
Fleck, Werner; Weinbrecht, Erwin; and Borner, Gerhard, 3,860,331.

Borowski, Norbert P.; Marek, Donald C.; Panek, Bruno J.; and Klaviter, Walter F., to International Harvester Company. Bucket mounting hinge. 3,860,131, Cl. 214-145.000.

Borrel, Marcel; Mathais, Henri; and Thevenon, Marcel, to Produits Chimiques Ugine Kuhlman. Process for the purification of crude acrolein by extractive distillation. 3,860,495, Cl. 203-17.000.

Borrmann, Ralf Fritz: *See—*
Weber, Theodor Alexander; and Borrmann, Ralf Fritz, 3,860,419.

Bosch, Julius, to Frieseke & Hopfner GmbH Erlangen-Bruck. System for determining the dust content of gases. 3,859,842, Cl. 73-28.000.

Bossert, Friedrich: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,860,601.

Boucher, C. Wendell; and Hanneman, Thomas W., to Garrett, Jim C.; Johnson, Robert H.; and Shelton, Jack, part interest to each. Voice frequency repeater. 3,860,767, Cl. 179-170.00G.

Bouygues, Jean; and Gerard, Rene, to Thomson-CSF. Device for the precise positioning on a mobile mounting, of an object holder introduced through an airlock into a vacuum-tight enclosure. 3,860,124, Cl. 214-1.0CM.

Boxer, Leo M.; and Boxer, Robert W., to Pauls, James D.; Burton, Robert R.; Minaker, Warren M.; Smith, James; Ooms, Owen J.; and Frank, Eli C., part interest to each. Safety cap. 3,860,133, Cl. 215-206.000.

Boxer, Robert W.: *See—*
Boxer, Leo M.; and Boxer, Robert W., 3,860,133.

Boye, Erhard Rudolf: *See—*
Engstrom, Per Ingemar; and Boye, Erhard Rudolf, 3,860,161.

Bradshaw, Harry Osborne, to Tube Products Limited. Strip accumulator. 3,860,188, Cl. 242-55.210.

Braginsky, Roman Pavlovich: *See—*
Shkundin, Lev Romanovich; Braginsky, Roman Pavlovich; Finkel, Eduard Emmanuilovich; and Leontiev, Jury Nikolaevich, 3,860,159.

Brandt, Bernd: *See—*
Reinhardt, Helmut; Brandt, Bernd; and Peters, Albert, 3,860,682.

Braschler, Steve A.; and Prather, George A., to Parmac, Inc. Individualized stator and rotor for hydromatic brakes. 3,860,097, Cl. 188-296.000.

Bratkowski, Walter V.: *See—*
Shoupp, William E.; Bratkowski, Walter V.; and Esposito, John N., 3,860,809.

Bratland, Arthur. Apparatus for processing of foodstuffs and the like, particularly milk products. 3,859,906, Cl. 99-460.000.

Braun, Anton. Linear balanced free piston machines. 3,859,966, Cl. 123-46.00R.

Breed, Charles P. Sliding snap shackle. 3,859,693, Cl. 24-241.0SL.

Breish, Donald E., to Sherman Car Wash Equipment Co. Scrubbing apparatus for vehicles. 3,859,686, Cl. 15-97.00R.

Brems, John Henry. Cyclicly repetitive motion generating system. 3,859,862, Cl. 74-82.000.

Brendgord, Thomas, to American Sterilizer Company. Enclosure structure for modular system. 3,860,309, Cl. 312-351.000.

Brennan, Richard L.: *See—*
Malone, James T.; Brennan, Richard L.; and Hallock, Donald D., 3,860,874.

Brethauer, Dale Merrill; and Prideaux, Jean Paul, to du Pont de Nemours, E. I., and Company. Apparatus for making non-woven fibrous sheet. 3,860,369, Cl. 425-3.000.

Breton, Roger. Self-tightening brake for bicycles, motorcycles and the like. 3,860,094, Cl. 188-24.000.

Bretschneider, Hermann; Grassmayr, Klaus; Hohenlohe-Oehringen, Kraft; and Grussner, Andre, to Hoffmann-La Roche Inc. Substituted sulfonyl urea and its stereoisomers as hypoglycemic agents. 3,860,724, Cl. 424-321.000.

Breuer, Hermann, to E. R. Squibb & Sons, Inc. Acylthiomethyl esters of cephalosporins. 3,860,591, Cl. 260-243.00C.

Bricmont & Associates, Inc.: *See—*
Bricmont, Francis H., 3,860,387.

Bricmont, Francis H., to Bricmont & Associates, Inc. Roller for supporting a workpiece in a furnace or the like. 3,860,387, Cl. 432-246.000.

Brink, Robert H., Jr.: *See—*
Shema, Bernard F.; Brink, Robert H., Jr.; and Swered, Paul, 3,860,516.
Shema, Bernard F.; and Brink, Robert H., Jr., 3,860,517.
Shema, Bernard F.; Brink, Robert H., Jr.; and Swered, Paul, 3,860,713.

Brinley-Hardy Co., Inc.: *See—*
Doering, Charles W.; and Smith, Samuel W., 3,859,685.

Brinly-Hardey Co., Inc.: *See—*
Doering, Charles W., 3,859,777.

Brisco, Joseph L., Sr. Percussion musical instrument. 3,859,886, Cl. 84-402.000.

Bristol-Myers Company: *See—*
Naito, Takayuki; Nakagawa, Susumu; and Oka, Masahisa, 3,860,574.

British Domestic Appliances Limited: *See—*
Wass, Anthony Charles Lammond, 3,860,786.

British Petroleum Company Limited, The: *See—*
Ells, John William, 3,860,039.

British Steel Corporation: *See—*
Thomas, William Ormond; and Harle, Cyril Dawson, 3,860,459.

Brown Boveri & Company Limited: *See—*
Laronze, Joseph, 3,860,840.

Brown Boveri-Sulzer Turbomachinery Ltd.: *See—*
Benz, Hans, 3,860,356.

Brown Boveri-Sulzer Turbomaschinen Aktiengesellschaft: *See—*
Frutschi, Hansulrich, 3,859,795.

Brown, Clyde O.; and Banas, Conrad M., to United Aircraft Corporation. Deep penetration welding using lasers. 3,860,784, Cl. 219-121.0LM.

Brown, George E., to Raymond Lee Organization, Inc., The, a part interest. Automobile with self contained jacks. 3,860,216, Cl. 254-86.00H.

Brown, Jack Frederick, to James Ross Limited. Doctor blade assembly. 3,859,690, Cl. 15-256.510.

Brown, John Vincent, to Fosroc A.G. Method of forming an anchor cable. 3,859,780, Cl. 57-162.000.

Brown & Root, Inc.: *See—*
Koehler, Albert M.; Crout, Jesse W.; and Shaw, Larry K., 3,859,804.

Browning, Malcolm Henry. Self-propelled direction marker. 3,860,906, Cl. 340-135.000.

Bruneau, Paul, to Societe Dite: Franciaflex. Vertical blind. 3,860,056, Cl. 160-176.000.

Brunn, Louis W.; Frayer, James A.; and Paraskos, John A., to Gulf Research & Development Company. Two-stage residual oil hydrodesulfurication process with ammonia addition. 3,860,511, Cl. 208-210.000.

Bruns, Carl Newton, to Stauffer Chemical Company. Silicone rubber composition yielding a structural ash on combustion. 3,860,554, Cl. 260-37.0SB.

Brunswick Corporation: *See—*
Woodfill, William L., 3,859,951.

Bryant Grinder Corporation: *See—*
Lovely, John W., 3,860,251.

Brymer, Barbara J.; Kapp, Edward J.; and Keister, Frank Z., to United States of America, Navy. Anti-compromise microelectronic circuit. 3,860,835, Cl. 307-298.000.

Bubley, Henry J.; and Oltra, Claude H., to American Screen Printing Equipment Company. Screen printing press. 3,859,917, Cl. 101-123.000.

Buchanan, James B. Golf ball driving range device. 3,860,236, Cl. 273-35.00B.

Buchanan, Samuel R. Drumstick gripping aid. 3,859,887, Cl. 84-422.000.

Buchberger, Hubert; and Hussel, Reinmar, to Siemens Aktiengesellschaft. Electrodynamic travelling field linear motor of the synchronous type. 3,860,839, Cl. 310-12.000.

Buchholz, James J.; and Peyton, Edward E. Dual recording and reproducing apparatus. 3,860,160, Cl. 226-177.000.

Buchner, Robert Bertold, to U.S. Philips Corporation. TDM switch with plural single-character buffers associated with each output line. 3,860,758, Cl. 179-15.0AQ.

Buckeye Steel Castings: *See—*
Snell, Ford F., 3,860,121.

Buckley, Bruce Harry, to RCA Corporation. Rotator system including a remote drive motor and a local indicator-control motor. 3,860,859, Cl. 318-265.000.

Buckley, Ronald D.: *See—*
Van Manen, Dick T.; and Buckley, Ronald D., 3,859,675.

Bucyrus-Erie Company: *See—*
Neimark, Jack D.; and Smith, Matthew, 3,860,126.

Budich, Wolfgang; Krah, Robert; and Theissen, Hans, to Dynamit Nobel Aktiengesellschaft. Extruded profile members, particularly of a thermoplastic synthetic material, for blind frames and sashes of sash windows, sliding doors, or the like. 3,859,754, Cl. 40-425.000.

Budrose, Charles R. Card adapter for tape recorder. 3,860,961, Cl. 360-88.000.

Buell, Eugene F., to Schuyler Development Corporation. Anti-inflammatory compositions. 3,860,702, Cl. 424-94.000.

Buell, Kenneth Barclay, to Procter & Gamble Co., The. Contractable side portions for disposable diaper. 3,860,003, Cl. 128-287.000.

Buess, Charles Merlyn: *See—*
Flickinger, Earl Dan; and Buess, Charles Merlyn, 3,860,610.

Bulteau, Gerard C., to Societe D'Etudes Scientifiques et Industrielles de L'Ile-De-France. Methods of treating biliary lithiasis. 3,860,721, Cl. 424-308.000.

Buonaprole, Ferruccio: *See—*
Romano, Giuliano; Buonaprole, Ferruccio; and Lodi, Fernando, 3,859,948.

Burke, Harry Dennis, to Whirlpool Corporation. Slide structure for refuse compactor. 3,860,308, Cl. 312-341.00R.

Burkholder Paving, Inc.: *See—*
Martin, Leon Z.; and Weaver, Benjamin Z., 3,860,288.

Burkin, Jury Alexandrovich; and Seleznev, Jury Emelyanovich. Method of manufacturing memory stacks. 3,859,720, Cl. 29-604.000.

Burroughs, Elvin O. Tool for securing conduit ends. 3,859,837, Cl. 72-410.000.

Burton, Gerald V.: *See—*
Forni, Joseph M, 3,860,038.

Burton, Robert R.: *See—*
Boxer, Leo M.; and Boxer, Robert W., 3,860,133.

Buschi, Marcus B., to Mueller, Jakob. Device for transforming rotary motion into oscillatory motion. 3,859,861, Cl. 74-42.000.

Butler Automatic, Inc.: *See—*
Bassett, Kirk W.; and Butler, Richard A., Jr., 3,859,883.

Butler, Richard A., Jr.: *See—*
Bassett, Kirk W.; and Butler, Richard A., Jr., 3,859,883.

Buxbaum, Lothar: *See—*
Habermeier, Jurgen; Buxbaum, Lothar; Porret, Daniel; and Batzer, Hans, 3,860,564.

Bye, Gerald Charles; Hack, Richard Charles; and Pennell, Anthony Robin, to Associated Portland Cement Manufacturers Limited, The. Method of making synthetic aggregates. 3,860,681, Cl. 264-66.000.

Byram, George W.: *See—*
Speiser, Jeffrey M.; and Byram, George W., 3,860,892.

Byrd, Lucid Lincoln, to Carter Precision Electric Company. Air pressure responsive switch for vehicle tire and the like with hinged contact and diaphragm. 3,860,772, Cl. 200-83.00N.

Byrd, Robert V.; and Mason, Clyde P., Jr., to Industrial Nucleonics Corporation. Plural range gauge. 3,860,168, Cl. 235-151.300.

Cacciari, Isabella: *See—*
Sermanni-Giovannozzi, Giovanni; and Cacciari, Isabella, 3,860,710.

Caffall, James E.: *See—*
McDonald, Howard E.; and Caffall, James E., 3,859,816.

Cairns, Hugh; Hunter, Dennis; and King, John, to Fisons Limited. Benzopyrans. 3,860,617, Cl. 260-345.200.

Calder, Brooke J., Jr.; Risko, Bernard L.; and Belock, Robert J., to Austin Powder Company. Method for making detonation cord device. 3,860,677, Cl. 264-3.00R.

Calgon Corporation: *See—*
Walker, Jerry Lee; and Cornelius, Thomas Edward, III, 3,860,430.

California Institute of Technology: *See—*
Campen, Charles F., Jr., 3,860,393.
Nicolet, Marc-Aurele; Bajorek, Christopher H.; and Feng, Joseph Shao-Ying, 3,860,450.
Shumka, Alex, 3,860,946.
Yariv, Amnon; and Armstrong, Desmond R., 3,860,880.

Calvert, Rodney K.; and Fishback, Alton J., to Mead Corporation, The. Means for applying an article carrier to a plurality of articles. 3,859,773, Cl. 53-48.000.

Camar S.A.: *See—*
Crotti, Piero, 3,859,839.

Cambridge Thermionic Corporation: *See—*
Lyman, Joseph, 3,860,300.

Campen, Charles F., Jr., to California Institute of Technology. Automated system for identifying traces of organic chemical compounds in aqueous solutions. 3,860,393, Cl. 23-230.00R.

Camras, Marvin. Video transducing apparatus. 3,860,951, Cl. 358-4.000.

Canon Kabushiki Kaisha: *See—*
Kano, Ichiro, 3,860,327.
Katayama, Hajime; Tsukada, Syusei; Kitajima, Talayuki; and Kuge, Tsukasa, 3,859,691.
Matsuno, Hiroshi; and Endo, Ichiro, 3,860,422.

Canter, James A., to General Motors Corporation. Ice maker control circuit. 3,859,813, Cl. 62-138.000.

Capell, Reginald Ernest: *See—*
Foulquies, Bernard Marie; Capell, Reginald Ernest; and Crookes, Brian, 3,859,825.

Caperton, Charles B. Inclined carriage for sewer rodding machine. 3,859,687, Cl. 15-104.3SN.

Caprari, Fausto, to RCA Corporation. Optical system. 3,860,335, Cl. 353-102.000.

Carabateas, Philip M., to Sterling Drug Inc. Octahydropyrrido[2,1-c][1,4]benzodiazepines. 3,860,600, Cl. 260-293.550.

Caraway, Mitchell R.: *See—*
Simmons, Smith H.; and Caraway, Mitchell R., 3,859,771.

Carella, Vincent: *See—*
Cooper, Julius; Ensmann, Burt; Nielsen, Edwin; and Carella, Vincent, 3,860,237.

Carley, Harold E.: *See—*
Kilbourn, Edward E.; Weir, William D.; and Carley, Harold E., 3,860,586.

Carley, James A., to Los Angeles Miniature Products, Inc. Hermetically sealed solid state lamp. 3,860,847, Cl. 313-110.000.

Carlson, Elmer A., to International Telephone and Telegraph Corporation. Comfort control system and components thereof. 3,860,837, Cl. 307-310.000.

Carlson, John A., to Conchemco, Incorporated. Retainer fitting for control assemblies. 3,860,352, Cl. 403-263.000.

Carmean, Ronald Eugene, to General Electric Company. Reducing patient X-ray dose during fluoroscopy with an image system. 3,860,817, Cl. 250-320.000.

Carnes, John K.: *See—*
Irvine, David; Barlow, Earl; Carnes, John K.; and Schmidt, William F., 3,860,119.

Carriazo, Jose B. Automated variable selection sandwich preparation device. 3,859,904, Cl. 99-450.400.

Carrieri, Louis F.: *See—*
Spanke, Edwin A.; Carrieri, Louis F.; and Francey, Melvin H., 3,860,100.

Carroll, Ronnie D.; Hamanaka, Ernest S.; Pirie, Donald K.; and Welch, Willard M., Jr., to Pfizer Inc. Penicillin ketenimine intermediates for preparing oxacillin. 3,860,585, Cl. 260-240.00R.

Carter Precision Electric Company: *See—*
Byrd, Lucid Lincoln, 3,860,772.

Carteus, Marc F. M.; Gopal, Raj; and Rawle, Derek T., to Westinghouse Electric Corporation. Reactor core component vibration monitro. 3,860,480, Cl. 176-19.00R.

Carteus, Marc F. M.: *See—*
Gopal, Raj; and Carteus, Marc F. M., 3,860,481.

Caruolo, Antonio B.; and Davis, Jack W., to United Aircraft Corporation. Stable platform structure for laser optics. 3,860,889, Cl. 331-94.50R.

Cary, Neal A. Plate and non-removable screw assembly. 3,859,764, Cl. 52-217.000.

Casper, Clarence, Jr.: *See—*
Games, John E.; Casper, Clarence, Jr.; and Kupersmith, Lertram F., 3,860,877.

Cassano, James R.; and Sanza, Frank J., to Xerox Corporation. Photoreceptor loading system. 3,860,189, Cl. 242-67.300.

Castine, William A., Jr., to PPG Industries, Inc. Packaging device. 3,860,116, Cl. 206-454.000.

Caswell, Robert L., to Rockwell International Corporation. Multiple voltage source imbalance detection and protection circuit. 3,860,855, Cl. 317-27.00R.

Caterpillar Tractor Company: *See—*
Yancey, John William, 3,860,083.

Cavanaugh, William F.: *See—*
Pedersen, Kristen I.; and Cavanaugh, William F., 3,859,803.

Cavicchi, Allen W.; and Ketting, Gabor T., to United Aircraft Corporation. Turbine blade tip seal. 3,860,358, Cl. 415-174.000.

Celli, Aldo. Shock absorbing tilt mechanism for stern drives for boats. 3,859,952, Cl. 115-41.00R.

Cencel, J. Arthur, to Becton, Dickinson Electronics Company. Capacitiv- position transducer. 3,860,918, Cl. 340-200.000.

Cercone, Daniel. Hair dryer nozzle. 3,860,174, Cl. 239-135.000.

Cernosek, Louis C. Positioning apparatus. 3,860,122, Cl. 214-1.00P.

Chabert, Henri; Aime, Robert; Gigiou, Claude; and Ruaud, Michel, to Rhone-Poulenc S.A. Novel polymerization initiator and process for polymerization using the same. 3,860,568, Cl. 260-92.80R.

Chambers, Harry A.; and Tillman, John C., to TRW Inc. Suspension system. 3,859,770, Cl. 52-741.000.

Chambers, Henry B., to Hydranautics. Chain jack. 3,860,215, Cl. 254-110.000.

Champagne, Edwin B.: *See—*
Kersch, Leonard A.; and Champagne, Edwin B., 3,860,346.

Chang, Tao-Yuan; and Wood, Obert Reeves, II, to Bell Telephone Laboratories, Incorporated. Optically pumped laser using N_2O or similar gas mixed with energy-transferring CO_2. 3,860,884, Cl. 331-94.50G.

Chantiers Navals de la Ciotat Etablissement du Trait: *See—*
Bieth, Andre Jean; Jeru, Henri Jean-Marie; and Bakker, Bernard Roger Pierre, 3,860,129.

Chapman, Derek D.: *See—*
McColgin, William C.; and Chapman, Derek D., 3,860,886.

Chappell, Peter Lee: *See—*
Roe, Malcolm David; Donald, John Henry; Chappell, Peter Lee; Kirk, Malcolm; Edwards, John David; and Greenham, Stanley Keith, 3,860,793.

Charneski, Mitchell D.: *See—*
McMurray, William C.; and Charneski, Mitchell D., 3,860,062.

Charny, Abram Khaimovich: *See—*
Molochnikov, Nikolai Vladimirovich; Patrikeev, Vladimir Sergeevich; Charny, Abram Khaimovich; and Schepkin, Viktor Alexeevich, 3,860,123.

Checkley, David M. Self-stiffened flexible kite. 3,860,204, Cl. 244-153.00R.

Chemetron Corporation: *See—*
Rogers, Gerald L., 3,860,032.
Turrill, Frank Hollister; Squire, Lyle Eli; and Towle, Jack Lewis, 3,860,621.

Cheo, Bernard Ru-Shao; Kosowsky, Lester H.; Smith, Peter W.; and Soong, An-Hwa, to United Aircraft Corporation. Unambiguous phase interferometer antenna. 3,860,934, Cl. 343-778.000.

Chesnick, John C. Archery peep sight. 3,859,733, Cl. 33-265.000.

Chesnut, William R. Apparatus and methods for merchandise tallying and automatic bagging. 3,860,091, Cl. 186-1.00A.

Chevron Research Company: *See—*
Anderson, Robert G., 3,860,625.
Guenther, Lloyd M., 3,859,696.
Guenther, Lloyd M., 3,859,697.

Chicago Bridge and Iron Company: *See—*
Johnson, Paul Richard; Teymourian, Jamshid; Rothrock, Elmer Weyman; Kircik, Willis James; and Lange, Kenneth Wilson, 3,859,805.

Chicago Pneumatic Tool Company: *See—*
Silvern, David H.; Minton, Stanley J.; and Patel, Ghanshyam C., 3,860,363.

Chicago Swimming Pool Manufacturing Inc.: *See—*
Thomson, David P., 3,859,674.

Child Resistant Packaging, Inc.: *See—*
Romney, Russell H., 3,860,136.

Chiyoda Chemical Engineering & Construction Co. Ltd.: *See—*
Terashima, Osamu; and Okabayashi, Ikuo, 3,859,798.

Chocolate International, Inc.: *See—*
Warkentin, Brian T., 3,860,730.

Chomerics, Inc.: *See—*
Lynn, William J.; and Seeger, Richard E., 3,860,771.

Chow, Ling George; and Vysniauskas, Jonas K., to Honeywell Information Systems Inc. Magnetic shunt assembly for bias field apparatus. 3,860,895, Cl. 335-298.000.

Chretien, Gilbert; Girard, Philippe; Lamy, Jean-Marc; and Menard, Christophe, to Rhone-Progil. Polymerizable compositions and articles produced therefrom and method. 3,860,555, Cl. 260-40.00R.

Christensen, Haldor; Lundt, Behren M. Freidrich; Gronwald, Frederick Christian; and Andersen, William, to Novo Terapeutisk Laboratorium A/S. Sulphonylurea derivatives. 3,860,619, Cl. 260-346.20R.

Chrysler Corporation: *See—*
Andersen, Paul H., 3,860,904.

Chubb Fire Security Limited: *See—*
Evans, John L., 3,860,176.

Ciba-Geigy AG: *See—*
Abel, Heinz; Hostettler, Hans; Berger, Alfred; Toepfl, Rosemarie; and Maeder, Arthur, 3,860,540.
Hegar, Gert; and Ramanathan, Visvanathan, 3,860,620.
Martin, Henry; Pissiotas, Georg; and Rohr, Otto, 3,860,632.
Meyer, Hans Rudolf, 3,860,584.
Peter, Richard; and Angliker, Hans-Joerg, 3,860,572.
Ramanathan, Visvanathan, 3,860,571.
Rushforth, Michael; and Winterbottom, Kenneth, 3,860,446.

Ciba-Geigy Corporation: *See—*
Habermeier, Jurgen; Buxbaum, Lothar; Porret, Daniel; and Batzer, Hans, 3,860,564.
Jaeger, Horst, 3,860,613.
Klemchuk, Peter, 3,860,558.
Lehmann, Hans; Wehrli, Peter; and Schreiber, Bruno, 3,860,541.
Maier, Christian, 3,860,150.
Model, Ernst; and Gati, Sandor, 3,860,604.

Cinque, Gregory M.: *See—*
Hinman, Bruce E.; Cinque, Gregory M.; and Soltow, William D., Jr., 3,860,911.

Cioni, Elisabetta; Cioni, Lucia; and Anichini Cioni, Rovena, widow. Feed fixture for handling machines of vials or the like. 3,860,107, Cl. 198-131.000.

Cioni, Lucia: *See—*
Cioni, Elisabetta; Cioni, Lucia; and Anichini Cioni, Rovena, widow, 3,860,107.

Citizen Watch Co., Ltd.: *See—*
Shimizu, Masami; and Jindai, Akio, 3,859,876.

Clark, Charles W.; Paulovich, John M.; and Perlberg, William, to Airwick Industries, Inc. Method and device for producing dry vapor. 3,860,401, Cl. 55-89.000.

Clauss, Julius A., Jr., to Borg-Warner Corporation. Automotive transmission. 3,859,872, Cl. 74-763.000.

Clayhold, Archie J.; Hanson, Walter F.; and Wells, Louis F. Pipe burying ripper and method. 3,859,809, Cl. 61-72.500.

Clayton, John Peter: *See—*
Ferres, Harry; and Clayton, John Peter, 3,860,579.

Clifton, Mary A. Hair clip. 3,860,014, Cl. 132-46.00R.

Coast Marine Associates, Inc.: *See—*
Gilbert, Anthony F.; and Munsey, John H., 3,860,085.

Cockerill-Ougree-Providence S.A.: *See—*
Donckel, Georges Henri; and Streel, Dominique Thomas Francois Leon Joseph Marie, 3,860,444.

Coes, Samuel H. Composite ceramic armor. 3,859,892, Cl. 89-36.00A.

Cohen, Bernard S., Co-Trustees in Bankruptcy of Frazier N. James, Sr.: *See—*
James, Frazier N., Sr.; and Walker, Thomas E. (said Walker assors. to), 3,860,118.

Cohlmeyer, Stanley H.; Harrell, Wade H.; and Knepper, William A., to United States Steel Corporation. Feed distributor for roll briquetting machine. 3,860,376, Cl. 425-237.000.

Colautti, Albert J., to General Motors Corporation. Swivel seat latch mechanism. 3,860,283, Cl. 296-65.00R.

Cole, Edward L.; and McCoy, Frederic C., to Texaco Inc. Alkylation aids. 3,860,531, Cl. 252-426.000.

Colella, Donald F.; and Kaiser, Carl, to SmithKline Corporation. α-Aminomethyl-4-hydroxy-3-sulfamyl-benzyl alcohols and 4-hydroxy-3-sulfamyl phenethylamines. 3,860,647, Cl. 260-556.0AR.

Colgate-Palmolive Company: *See—*
Bechtold, Charles L., 3,860,525.

Colston, John R., to Westinghouse Electric Corporation. Breathing assist apparatus. 3,859,995, Cl. 128-145.800.

Commercial Decal, Inc.: *See—*
Blanco, Louis A.; and Meade, Hazel W., 3,860,471.

Commissariat a L'Energie Atomique: *See—*
Lascoux, Pierre, 3,860,167.

Compump System, Inc.: *See—*
Aronson, David; and Zumbusch, Peter C., 3,860,364.

Comstock & Wescott, Inc.: *See—*
Aspinwall, Peter, 3,860,158.

Conaway, Harold L.: *See—*
Aepli, Otto T.; Sorgenfrei, Malachy E.; and Conaway, Harold L., 3,860,521.

Conchemco, Incorporated: *See—*
Carlson, John A., 3,860,352.

Conn, John B.: *See—*
Hinkley, David F.; and Conn, John B., 3,860,659.

Conrad, Rene. Positive centering rollers or pulleys for woven wire belting conveyers. 3,859,865, Cl. 74-241.000.

Conrad, Rene, to Dynaloc Corporation. Method of making self-centering pulley using mig welding. 3,860,780, Cl. 219-76.000.

Consiglio Nazionale delle Richerche: *See—*
Sermanni-Giovannozzi, Giovanni; and Cacciari, Isabella, 3,860,710.

Consolidated Controls Corporation: *See—*
Wang, William S., 3,860,277.

Consolidated Video Systems, Inc.: *See—*
Tallent, Michael W.; Scaggs, Lee E.; Swain, Allan L.; Harrison, Ronnie M.; and Hendershot, William B., III, 3,860,952.

Construction Forms, Inc.: *See—*
Westerlund, Robert E.; Westerlund, Herbert A.; and Binsfeld, George H., 3,860,175.

Container Corporation of America: *See—*
Helms, Charles Robert, 3,860,113.

Continental Can Company, Inc.: *See—*
Mahajan, Gautam K.; and Suthard, Robert A., 3,860,086.
Moller, Jens L., 3,859,942.

Continental Oil Company: *See—*
Lindemuth, Laurence D.; Whitehead, Donald K.; and Fronczek, Chester, 3,860,520.
McCain, David L.; Haworth, Gordon R.; and Umphrey, Ronald W., 3,860,027.
Starks, Charles M., 3,860,451.
Yates, James E., 3,860,664.

Continentale Linoleum Union Betriebs AG: *See—*
Fanto-Kuertoes, Peter Robert; and Marek, Ralf Stellan, 3,860,370.

Control Data Corporation: *See—*
Mayer, William N., 3,860,846.

Cool Industry (Patents) Limited: *See—*
Roberts, Alan Gregson; Wilkins, Dennis Malcolm; and Wright, Malcolm Arthur, 3,859,963.

Cooley, Robert H. Reciprocal actuating means for rotating conveyor rollers. 3,860,106, Cl. 198-127.00R.

Cooper, Barrie William: *See—*
Baker, Julian, 3,860,962.

Cooper, Doreen Christine: *See—*
Baker, Julian, 3,860,962.

Cooper, Julius; Ensmann, Burt; Nielsen, Edwin; and Carella, Vincent, to Ideal Toy Corporation. Toy vehicle racing game. 3,860,237, Cl. 273-86.00R.

Cooper, Peter Garfield, III, to Gulf Research & Development Company. Process for the aerobic cultivation of microorganisms. 3,860,488, Cl. 195-109.000.

Cooper, Peter Garfield, III, to Gulf Research & Development Company. Process and apparatus for the aerobic cultivation of microorganisms. 3,860,489, Cl. 195-139.000.

Coran, Aubert Yaucher; and Kerwood, Joseph Edward, to Monsanto Company. N-(thio)-hydantoins. 3,860,605, Cl. 260-309.500.

Corbett, Dennis Thomas, to Hemlab A.G. Solid block flocculent with controlled release rate. 3,860,526, Cl. 252-181.000.

Corey, Albert E.: *See—*
Donermeyer, Donald D.; and Corey, Albert E., 3,860,553.

Cornelius, Thomas Edward, III: *See—*
Walker, Jerry Lee; and Cornelius, Thomas Edward, III, 3,860,430.

Corometrics Medical Systems, Inc.: *See—*
Langley, Lawrence W., 3,859,984.

Cosby, Floyd M. Golf clubs of the type known as woods. 3,860,244, Cl. 273-167.00F.

Cosden Oil & Chemical Company: *See*—
Watson, James M., 3,860,614.
Costa, Erminio Natale. Drip irrigation. 3,860,179, Cl. 239-542.000.
Cotter, Mitchell A.: *See*—
Nadler, Bernard David; and Cotter, Mitchell A., 3,860,770.
Coucoulas, Alexander; and Dabby, Franklin Winston, to Western Electric Company, Incorporated. Bonding of optical components. 3,860,405, Cl. 65-42.000.
Coult, John H. Friction-driven rotary cleaning apparatus with cooperative complementary tool means. 3,859,683, Cl. 15-4.000.
Coulter Electronics, Inc.: *See*—
Jones, Alan Richardson, 3,860,347.
Covelli, Fred M., to Koppers Company, Inc. Preparation of hydroxyquinolines. 3,860,599, Cl. 260-289.00R.
Covey, Michael F., to Gulf Research & Development Company. Combating fungus diseases of plants with naphthalic anhydride. 3,860,720, Cl. 424-285.000.
CPC International Inc.: *See*—
Landwerlen, Richard G.; and Kritchevsky, Theodore H., 3,860,536.
Crain, Gerald E., to Texas Instruments Incorporated. Conformal array antenna/receiver processor system. 3,860,929, Cl. 343-113.00R.
Cranberg, Lawrence, to Cranberg, Lawrence. Neutron generator target assembly. 3,860,827, Cl. 250-499.000.
Crawford, Donald C.: *See*—
Besserdich, Orrin H.; and Crawford, Donald C., 3,859,898.
Crawford, F. Robert. Solar heater. 3,859,980, Cl. 126-271.000.
CRC-Crose International, Inc.: *See*—
Wittman, Eric W., 3,860,785.
Crespolini, Giancarlo: *See*—
Vargiu, Silvio; Giovanni, Sesto S.; Pitzalis, Mario; and Crespolini, Giancarlo, 3,860,561.
Cronier, Henry J. Apparatus for supporting and positioning heavy and cumbersome objects. 3,860,228, Cl. 269-54.500.
Crookes, Brian: *See*—
Foulquies, Bernard Marie; Capell, Reginald Ernest; and Crookes, Brian, 3,859,825.
Crotti, Piero, to Camar S.A. System and device for avoiding any change of the cross section of tubular bodies during their cold bending. 3,859,839, Cl. 72-465.000.
Crout, Jesse W.: *See*—
Koehler, Albert M.; Crout, Jesse W.; and Shaw, Larry K., 3,859,804.
Crouzet: *See*—
Jullien-Davin, Jean, 3,860,841.
Crump, John M., Jr. Soiled diaper wringer device. 3,859,670, Cl. 4-1.000.
Cumberland Engineering Company, Inc.: *See*—
Peterson, Russell Irving, 3,860,182.
Cumberland Packing Corporation: *See*—
Eisenstadt, Benjamin, 3,860,732.
Cunningham, Donald M.; and Santore, Ralph, to Emerson Electric Co. Method of making electric heater assemblies. 3,859,721, Cl. 29-611.000.
Cunningham, Michael P.; and McClune, David J., to Eastman Kodak Company. Subbed lithographic printing plate. 3,860,426, Cl. 96-86.00P.
Cuq, Pierre, to Agence Nationale de Valorisation de la Recherche "Anvar". Swaging machine for tubular workpieces, with regulation of the thickness. 3,859,833, Cl. 72-189.000.
Cursel: *See*—
Derville, Marc, 3,860,472.
Curtiss-Wright Corporation: *See*—
De Feo, Angelo; and Drewniany, Edward F., 3,860,101.
De Feo, Angelo, 3,860,359.
Leto, Anthony; Jaklitsch, Richard F.; and Ackerman, Edward R., 3,859,785.
Cutler, Cassius Chapin; Limb, John Ormond; and Rubinstein, Charles Benjamin, to Bell Telephone Laboratories, Incorporated. Method and apparatus for encoding color video signals. 3,860,953, Cl. 358-13.000.
Czapor, Henry P. Dental strip. 3,860,013, Cl. 132-91.000.
D and B Machine Company: *See*—
Mims, Herman Dewitt, 3,859,896.
D. H. Prowse and Company Limited: *See*—
Prowse, Derek Henry George; and Prowse, Stephen Derek, 3,860,400.
Dabby, Franklin Winston: *See*—
Coucoulas, Alexander; and Dabby, Franklin Winston, 3,860,405.
Dahm, Per. Wall rails for fixing of wall panels and for interior fittings. 3,859,763, Cl. 52-36.000.
Dake corporation: *See*—
Kihnke, Lee S., 3,859,775.
Dalia, John F. Thief-proof door pull for automobiles. 3,860,278, Cl. 292-347.000.
Dalibor, Horst: *See*—
Katsimbas, Themistoklis; Dalibor, Horst; Kiessling, Hans-Joachim; and Schmidt, Rolf, 3,860,563.
Dannner, Robert, to Kinnear, Joseph D. Dangler cathode cable assembly. 3,860,320, Cl. 339-100.000.
Darboven, Ernest F., Jr., to Singer Company, The. Velocity-altimeter frequency-modulation continuous-wave doppler system. 3,860,925, Cl. 343-9.000.
Dargols, Bernard. Adjustable screen frame holder. 3,859,918, Cl. 101-127.100.
Darnell, Dana R.; and Harrison, Clarence E., Jr., to Ford Motor Company. Thermocouple-controlled operational amplifier circuit. 3,860,875, Cl. 328-3.000.
Dassler, Adolf. Gripper elements for sports shoes. 3,859,739, Cl. 36-67.00D.
Data Interface, Inc.: *See*—
Ott, Owen J.; and Ginn, David W., 3,859,959.
Dataplex Limited: *See*—
Roe, Malcolm David; Donald, John Henry; Chappell, Peter Lee; Kirk, Malcolm; Edwards, John David; and Greenham, Stanley Keith, 3,860,793.
Dauch Seiyaku Company, Limited: *See*—
Ikeda, Osamu; and Kato, Motohiko, 3,860,706.
David Brown, Gear Industries Limited: *See*—
Whateley, Eric Albert, 3,859,870.
Davidson, James B.: *See*—
Miner, Kenneth G.; Talcott, Thomas D.; Davidson, James B.; and Batdorf, David B., 3,860,008.
Davin, John Joseph. Preceding motor vehicle observation spacing guide. 3,859,732, Cl. 33-264.000.
Davis, George B., Jr. Telescoping pushrod tube. 3,859,969, Cl. 123-90.610.
Davis, George B., Jr. Coat hanger shoulder support attachment. 3,860,153, Cl. 223-88.000.
Davis, Gerald Wayne; and Sheats, Jimmy Bernard, to Fiber Industries, Inc. Basic dyeable polyamides. 3,860,560, Cl. 260-49.000.
Davis, Jack W.: *See*—
Caruolo, Antonio B.; and Davis, Jack W., 3,860,889.
Davis, Rachel D. Disposable bed covering. 3,859,678, Cl. 5-334.00R.
Dawson, Robert Herman, to RCA Corporation. High frequency voltage-variable capacitor. 3,860,945, Cl. 357-14.000.
DCA Food Industries Inc.: *See*—
Kaufman, Harold B.; Roth, Howard; and McCarthy, John P., 3,860,373.
Dean, William J.: *See*—
Kaplan, Abner; and Dean, William J., 3,859,922.
Debock, Luke Francois: *See*—
Wichman, Sven Hjalmar; and Debock, Luke Francois, 3,860,140.
Decca Limited: *See*—
Spiller, Basil Harry Royston; and Phillipson, Alan, 3,860,382.
Decision Data Computer Corporation: *See*—
Hunter, Alexander, 3,859,915.
DeClerck, Michael C.: *See*—
Krackeler, Joseph J.; and DeClerck, Michael C., 3,860,676.
De Feo, Angelo; and Drewniany, Edward F., to Curtiss-Wright Corporation. Synchronous clutch assembly for a transmission device. 3,860,101, Cl. 192-53.00F.
De Feo, Angelo, to Curtiss-Wright Corporation. Mounting system for gas turbine power unit. 3,860,359, Cl. 415-209.000.
De Grazia, Victor S., to Ford Motor Company. Clutch actuating mechanism. 3,859,866, Cl. 74-512.000.
Del Mar Engineering Laboratories: *See*—
Del Mar, Bruce E., 3,860,235.
Dell, Billy Clyde. Force converting device. 3,860,355, Cl. 415-7.000.
Dell, William; and Parker, Robert E., to Westinghouse Canada Limited. Optical line following program control system. 3,860,862, Cl. 318-568.000.
Del Mar, Bruce E., to Del Mar Engineering Laboratories. Portable exercise machine including mounting frame therefor. 3,860,235, Cl. 272-73.000.
DeLuca, John J., to United States of America, National Aeronautics and Space Administration. Bonding of sapphire to sapphire by eutectic mixture of aluminum oxide and zirconium oxide. 3,859,714, Cl. 29-472.700.
Demonte, Filippo, to Ing. C. Olivetti & S.p.A. Apparatus for recognising graphic symbols. 3,860,909, Cl. 340-146.3AC.
Demuth, Hans, to Sulzer Brothers Ltd. Device for severing filamentary material under a squeezing force. 3,859,882, Cl. 83-482.000.
Denayer, Rene. 1,5-Etheno-2h-3-benzazepin-2-ones. 3,860,580, Cl. 260-239.30T.
Derville, Marc, to Cursel. Method for manufacturing a synthetic leather base. 3,860,472, Cl. 156-148.000.
DeSoto, Inc.: *See*—
Kreider, Robert W., 3,860,544.
Sekmakas, Kazys, 3,860,549.
Dessau, Ralph M.: *See*—
Heiba, El Ahmadi I.; and Dessau, Ralph M., 3,860,612.
Dethloff, Kenneth W.: *See*—
Bartz, Fred H.; and Dethloff, Kenneth W., 3,859,679.
Detjen, Edgar W.: *See*—
Enters, Edward W.; and Detjen, Edgar W., 3,860,181.
Detroit Edison Company, The: *See*—
McMurray, William C.; and Charneski, Mitchell D., 3,860,062.
Deussner, Herbert, to Klockner-Humboldt-Deutz Aktiengesellschaft. Device for securing a raceway to the casing of a rotary tube such as a rotary kiln, particularly. 3,860,303, Cl. 308-204.000.
Deuterium Corporation: *See*—
Spevack, Jerome S., 3,860,698.
Devro, Inc.: *See*—
Tanner, Alistair Gilmour; and Wallace, James Tarleton, 3,860,728.
Dewhurst, Ernest James. Divider construction. 3,860,163, Cl. 229-52.00R.

De Witt, David; and Johnson, William S., to International Business Machines Corporation. Field effect transistor structure for minimizing parasitic inversion and process for fabricating. 3,860,454, Cl. 148-1.500.

Dewitt, William J.; and Tuvell, Melvin E., to Ethyl Corporation. Chemical composition containing mixed olefins. 3,860,528, Cl. 252-182.000.

Diamond, Julius, to William H. Rorer, Inc. P-cyclohexyl alpha - lower alkanoylthio hydrocinamic acid. 3,860,624, Cl. 260-455.00R.

Diamond, Julius; and Novick, William J., Jr., to William H. Rorer, Inc. 1-(P-trifluoromethoxyphenyl)-biguonide. 3,860,648, Cl. 260-565.000.

Diamond Shamrock Corporation: *See—*
Beckers, Norman L., 3,860,665.
Beckers, Norman L., 3,860,666.
Rowe, Edward A., 3,860,037.

Diebner, Robert L., to Dow Chemical Company, The. Preparation of ammelides. 3,860,594, Cl. 260-249.500.

Diecomp, Inc.: *See—*
Levine, Richard Carl, 3,860,803.

Di Marzo, Vincent. Cigarette control dispenser. 3,860,144, Cl. 221-15.000.

Dindun, Alexandr Stanislavovich: *See—*
Gavar, Valdis Valdovich; Dindun, Alexandr Stanislavovich; Kramer, Mark Maximovich; Platatsis, Ernest Yanovich; Mikelson, Artur Eduardovich; and Tomson, Elmar Yanovich, 3,860,825.

Dinnerstein, Albert J.: *See—*
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Di Tullio, Nicholas W.: *See—*
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DND Corporation: *See—*
Sherer, C. Richard; and Foyle, Russell M., 3,859,877.

Dobney, William Edwin, to Applied Air Conditioning Equipment Pty. Ltd. Compressor, condenser, evaporator structure. 3,859,820, Cl. 62-506.000.

Dobson Park Industries Limited: *See—*
Mappin, Henry, 3,860,290.

Dr. C. Otto & Comp. G.m.b.H.: *See—*
Pries, Erich E., 3,860,493.

Doering, Charles W.; and Smith, Samuel W., to Brinley-Hardy Co., Inc. Debris collector. 3,859,685, Cl. 15-83.000.

Doering, Charles W., to Brinly-Hardey Co., Inc. Thatching apparatus. 3,859,777, Cl. 56-16.700.

Dohring, Albert A.; and Dohring, Grace H. Acupuncture locating device and needle guide. 3,859,983, Cl. 128-2.10C.

Dohring, Grace H.: *See—*
Dohring, Albert A.; and Dohring, Grace H., 3,859,983.

Dohse, Ruthard, to Elektro-Thermit GmbH. Closing device for movable parts in railway frog and crossing areas. 3,860,205, Cl. 246-468.000.

Dokuzoguz, Halit Zafer; and Roberts, George Leathwhite, Jr. Process for upgrading of titaniferous materials. 3,860,412, Cl. 75-1.000.

Dole Electro-Systems, Incorporated: *See—*
Williams, Lon A.; and Reid, Walter L., Jr., 3,859,706.
Williams, Lon A.; and Williams, George B., 3,860,317.

Domke, Klaus: *See—*
Finkelmeier, Hans-Joachim; Domke, Klaus; and Lau, Peter, 3,860,047.

Donakowski, William A.; Morgan, John R.; and Roemming, Karl, to Ford Motor Company. Method of forming dimensional holes in the wankel rotor housing electroform. 3,860,058, Cl. 164-101.000.

Donald, John Henry: *See—*
Roe, Malcolm David; Donald, John Henry; Chappell, Peter Lee; Kirk, Malcolm; Edwards, John David; and Greenham, Stanley Keith, 3,860,793.

Donckel, Georges Henri; and Streel, Dominique Thomas Francois Leon Joseph Marie, to Cockerill-Ougree-Providence S.A.; and Acieries Reunies De Burbach-Eich-Dudelange S.A. Coating of workpieces by vapor deposition. 3,860,444, Cl. 117-107.000.

Donermeyer, Donald D.; and Corey, Albert E., to Monsanto Company. Acid-modified poly(vinyl acetate-vinyl propionate) textile sizes. 3,860,553, Cl. 260-33.8UA.

Donko, Heinz, to Norma Messtechnik Gesellschaft m.b.H. Circuit for ergodic processing of periodic and aperiodic signals. 3,860,799, Cl. 235-150.300.

Donzis, Byron A., to Flex-A-Court, Inc. Prefabricated tennis court assembly. 3,859,768, Cl. 52-476.000.

Dor, Abraham A.: *See—*
McGauley, Patrick J.; and Dor, Abraham A., 3,860,696.

Dorman, Linneaus C., to Dow Chemical Company, The. 3,5-Dihalo-4-carboxyalkoxy phenols and esters thereof. 3,860,633, Cl. 260-473.00G.

Dornberger, George Christian Ernst, to Western Electric Company, Incorporated. Methods and apparatus for locating an open section in a conductor. 3,860,866, Cl. 324-52.000.

Dorsky, Julian: *See—*
Easter, William M., Jr.; Dorsky, Julian; and Tavares, Robert F., 3,860,657.

Douglas, Raymond J.; Libby, Edward W.; and Moquin, Leonard R., to Mattel, Inc. Lean velocipede. 3,860,264, Cl. 280-266.000.

Douma, William L.; and Gandi, Robert A., to Becton, Dickinson and Company. Reservoir bag for anesthesiology. 3,859,997, Cl. 128-202.000.

Dove, Robert L., to Picker Corporation. Apparatus for supporting patient during rotation with provision for fluid administration and discharge. 3,859,982, Cl. 128-2.00R.

Dow Chemical Company, The: *See—*
Anderson, Gene A.; Bailey, Robert E.; and Gum, Wilson F., Jr., 3,860,663.
Diebner, Robert L., 3,860,594.
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Ham, George E.; and Temer, Don J., 3,860,576.
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Newman, Ritchey O., Jr., 3,860,372.
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Dow Corning Corporation: *See—*
Abbott, Eugene A.; and Isquith, Alan J., 3,860,709.
Miner, Kenneth G.; Talcott, Thomas D.; Davidson, James B.; and Batdorf, David B., 3,860,008.

Doyle, Edward J., to Schick Incorporated. Applicator package for fluid products. 3,860,348, Cl. 401-6.000.

Dragoco Gerberding & Co. GmbH: *See—*
Huth, Heinz; and Werner, Klaus, 3,860,734.

Dravo Corporation: *See—*
Jaco, Charles M., Jr., 3,859,799.

Dreisin, Alexander, to Allis-Chalmers Corporation. Engine retarder brake. 3,859,970, Cl. 123-97.00B.

Dreisin, Alexander, to Allis-Chalmers Corporation. Timing device for fuel injector. 3,859,973, Cl. 123-139.0AQ.

Dresser Industries, Inc.: *See—*
Abney, David Lewis; and Williams, Robert Carl, 3,860,068.
Rauch, Glenn A.; and Hess, Robert E., 3,860,291.
Wilson, Billy F., 3,860,816.
Winberg, Douglas F.; and Dyer, Norman D., 3,859,810.

Drewniany, Edward F.: *See—*
De Feo, Angelo; and Drewniany, Edward F., 3,860,101.

Drexelbrook Controls, Inc.: *See—*
Maltby, Frederick L.; and Kramer, L. Jonathan, 3,860,882.

Dripke, Manfred, to Zwick & Co. Kommanditgesellschaft. Test frame with selectively positionable specimen holders. 3,859,848, Cl. 73-93.000.

Duffek, Edward F.; Funk, Ernest J.; Jankowski, Alfred S.; Lane, Jack C.; Lehner, William L.; Oliver, Floyd F.; and Schneider, Mark, to Signetics Corporation. System and method for attaching semiconductor dice to leads. 3,859,715, Cl. 29-588.000.

Dulude, Donald O.; and Winbigler, Paul H., to Kuhlman Corporation. Machines for the manufacture of spring assemblies. 3,859,705, Cl. 29-200.00B.

Duncan, Allan George, to United Kingdom Atomic Energy Authority. Dewaxing of a hydrocarbon feedstock by direct contact with a refrigerant. 3,859,811, Cl. 62-58.000.

Dunegan, Ronald G.: *See—*
Grove, Marvin H.; and Dunegan, Ronald G., 3,860,033.

Dunlop Limited: *See—*
Prottey, Frederick Vernon, 3,860,054.

Dunne, Brian B., to Ship Systems, Inc. Laser-guided projectile system. 3,860,199, Cl. 244-3.130.

du Pont de Nemours, E. I., and Company: *See—*
Blume, Roe Calvin, 3,860,669.
Brethauer, Dale Merrill; and Prideaux, Jean Paul, 3,860,369.
Garnar, Thomas Edward, Jr., 3,860,435.
Jayawant, Madhusudan D., 3,860,694.
Keim, Kenneth John; and Landman, Dirk, 3,859,708.
Krespan, Carl G., 3,860,611.
Lawrence, John Brian, 3,860,673.
Moore, Earl P., Jr., 3,860,476.
Scherer, Richard A., 3,860,468.
Schroeder, Herman E., 3,860,052.
Simmons, Walter J., 3,860,475.
Tarney, Robert Edward; and Verbanc, John J., 3,860,505.

Durin, Michel, to Societe Anonyme Automobiles Cirtoen. Installations for forming an electrolytic coating. 3,860,508, Cl. 204-198.000.

Durkoppwerke GmbH: *See—*
Fenzl, Horst, 3,859,937.

Durrum Instrument Corporation: *See—*
Stickney, Michael E., 3,859,859.

Dussia, Raymond J.: *See—*
Moore, Beal P.; and Dussia, Raymond J., 3,860,028.

Dworkin, Howard S. End construction for bellows type envelopes and the like. 3,860,164, Cl. 229-61.000.

Dye, John F.; Binard, William J.; and Anglada, Leonard R., to Kendall Company, The. Apparatus for measuring a liquid discharge. 3,859,854, Cl. 73-215.000.

Dye, John F.: *See—*
Binard, William J.; and Dye, John F., 3,860,007.

Dyer, Norman D.: *See—*
Winberg, Douglas F.; and Dyer, Norman D., 3,859,810.

Dynaloc Corporation: *See—*
Conrad, Rene, 3,860,780.

Dynamit Nobel Aktiengesellschaft: *See—*
Budich, Wolfgang; Krah, Robert; and Theissen, Hans, 3,859,754.

E. R. Squibb & Sons, Inc.: *See—*
Breuer, Hermann, 3,860,591.

E. S. & A. Robinson (Canada) Ltd.: *See—*
White, David B., 3,859,895.

Eagle-Picher Industries, Inc.: *See—*
Petrus, Steve, 3,860,273.

Easter, William M., Jr.; Dorsky, Julian; and Tavares, Robert F., to Givaudan Corporation. Process for the preparation of citronellal. 3,860,657, Cl. 260-601.00R.

Eastman Kodak Company: *See—*
Cunningham, Michael P.; and McClune, David J., 3,860,426.
Gysling, Henry J., 3,860,500.
Gysling, Henry J., 3,860,501.
Harvey, Donald M., 3,860,936.
Holzhauser, Ronald Charles; and Kosarko, Gerald Julius, 3,860,195.
McColgin, William C.; and Chapman, Derek D., 3,860,886.
Peschel, Heinz; and Radtke, Manfred, 3,860,198.
Ponticello, Ignazio S.; Perry, Ernest J.; and Tuites, Richard C., 3,860,428.

Ebauches S.A.: *See—*
Schneiter, Ali, 3,859,784.

Ebeling, Frederick A.: *See—*
Johnson, Roger L.; Ebeling, Frederick A.; and Parry, James H., 3,860,754.

Eberhardt, H. Alfred, to Hale Fire Pump Company. Method for making a check valve for a pump. 3,859,703, Cl. 29-156.70R.

Eberly, Paul E., Jr., to Exxon Research & Engineering Co. Solvent extraction of aromatic hydrocarbons with 1,2,3-tris-(2-cyanoethoxy)-propane. 3,860,512, Cl. 208-330.000.

Eckhart, Edgar O., to Becton, Dickinson and Company. Angiography valve. 3,859,985, Cl. 128-2.05R.

Edlund, Richard P.: *See—*
Kimbell, Wayne L.; and Edlund, Richard P., 3,860,755.

Edwards, John David: *See—*
Roe, Malcolm David; Donald, John Henry; Chappell, Peter Lee; Kirk, Malcolm; Edwards, John David; and Greenham, Stanley Keith, 3,860,793.

Egnaczak, Raymond K., to Xerox Corporation. Multiple exposure method and apparatus. 3,860,337, Cl. 355-4.000.

Ehgartner, Gabriele: *See—*
Zobel, Siegfried; Spinnler, Rainer; Ehgartner, Gabriele; and Hennig, Fridolin, 3,860,938.

Ehrlich, Stanley L.; and Medeiros, Anthony F., to Raytheon Company. Wide band transducer. 3,860,901, Cl. 340-10.000.

Ehrlich, Stanley L., to Raytheon Company. Super-directive system. 3,860,928, Cl. 343-100.0SA.

Eisenberg, Gundolf: *See—*
Kling, Alfred; Specht, Viktor; Hofstetter, Carmen; and Eisenberg, Gundolf, 3,860,391.

Eisenstadt, Benjamin, to Cumberland Packing Corporation. Salt substitute. 3,860,732, Cl. 426-219.000.

Elektro-Thermit GmbH: *See—*
Dohse, Ruthard, 3,860,205.

Eli Lilly and Company: *See—*
Kukolja, Stjepan, 3,860,577.

Elite Manufacturing Company Limited: *See—*
Victor, Harold, 3,860,120.

Ellis, Crawford M., to United Merchants and Manufacturers, Inc. Control system for high pile circular knitting machines. 3,859,823, Cl. 66-9.00B.

Ells, John William, to British Petroleum Company Limited, The. Pipelines. 3,860,039, Cl. 138-103.000.

Emanuel, Carl F., deceased (by Emanuel, Mary Victoria, administratrix), to Boeing Company, The. Process for growing bacteria or fodder. 3,860,487, Cl. 195-96.000.

Emanuel, Mary Victoria, administratrix: *See—*
Emanuel, Carl F., deceased, 3,860,487.

Embassy Industries, Inc.: *See—*
Wenig, Norman B., 3,860,206.

Emerson Electric Co.: *See—*
Cunningham, Donald M.; and Santore, Ralph, 3,859,721.
Karls, Robert F.; and Enright, James H., 3,859,908.
Karls, Robert F.; and Enright, James H., 3,859,911.

Emmett, Robert Clarence, Jr., to Envirotech Corporation. Continuous electrowinning cell. 3,860,509, Cl. 204-281.000.

Endo, Hidetomo, to Kyokuto Chosa - Sekkei Co. Ltd. Method for determining the position of a camera from a photograph taken thereby and device for performing the same method. 3,859,731, Cl. 33-227.000.

Endo, Ichiro: *See—*
Matsuno, Hiroshi; and Endo, Ichiro, 3,860,422.

Engineered Concrete Placer, Inc.: *See—*
Semple, Charles A., 3,860,035.

Engstrom, Per Ingemar; and Boye, Erhard Rudolf, to Gunnebo Bruks Aktiebolag. Cartridge tool with pocket arranged under the barrel. 3,860,161, Cl. 227-10.000.

Enright, James H.: *See—*
Karls, Robert F.; and Enright, James H., 3,859,908.
Karls, Robert F.; and Enright, James H., 3,859,911.

Ensmann, Burt: *See—*
Cooper, Julius; Ensmann, Burt; Nielsen, Edwin; and Carella, Vincent, 3,860,237.

Enterprise Brass Works: *See—*
Nelson, Lowell F., 3,860,025.

Enters, Edward W.; and Detjen, Edgar W., to Gilson Bros. Co. Shredding machine. 3,860,181, Cl. 241-55.000.

Envirotech Corporation: *See—*
Emmett, Robert Clarence, Jr., 3,860,509.

Erath, Wolfgang, to Knorr-Bremse GmbH. Electrical antiskid device for vehicles. 3,860,298, Cl. 303-21.0BE.

Erdman, William Charles; and Garbarini, Victor Charles, to Bell Telephone Laboratories, Incorporated. Oxide etchant. 3,860,464, Cl. 156-7.000.

Erickson, Lennart G.: *See—*
Kissinger, Ralph, Jr., 3,859,962.

Erickson, Wayne K., to Phillips Petroleum Company. Stuffer box control. 3,859,695, Cl. 28-1.700.

Ermush, Nina Avgustovna: *See—*
Putnin, Aina Yanovna; Shvarts, Evgenia Mikhailovna; Ermush, Nina Avgustovna; Ievinsh, Alfred Fritsevich; and Kalninsh, Arvid Yanovich, 3,860,626.

Errante, Joseph: *See—*
Azelborn, Nicolas Alan; Errante, Joseph; and Paluszny, Antoni, 3,859,786.

Esanu, David, deceased: *See—*
Viout, Andre; and Esanu, David, deceased, 3,860,700.

Esposito, Francesco: *See—*
Leonardo, Onofrio; Giorgio, Giacomo; and Esposito, Francesco, 3,860,607.

Esposito, John N.: *See—*
Shoupp, William E.; Bratkowski, Walter V.; and Esposito, John N., 3,860,809.

Estes, James D.: *See—*
Stroud, Stanley G.; and Estes, James D., 3,860,865.

Estey Corporation: *See—*
Mastranardi, Pasquale J., 3,860,171.

Etat Francais: *See—*
Pierre, Bernard, 3,859,891.
Raillere, Raymond; and Fulachier, Georges Edward, 3,860,345.

Etherington, Ralph; and Riviere, Henry W., to General Electric Company. Radio frequency amplifier. 3,860,881, Cl. 330-21.000.

Ethyl Corporation: *See—*
Dewitt, William J.; and Tuvell, Melvin E., 3,860,528.
Gautreaux, Marcelian F.; McCarthy, John H.; Foster, Walter E.; Hutchinson, Donald O.; and Frey, Frederick W., 3,860,415.
Gautreaux, Marcelian F.; McCarthy, John H.; Foster, Walter E.; Hutchinson, Donald O.; and Frey, Frederick W., Jr., 3,860,416.
Lee, Thomas E.; and Frey, Frederick W., 3,860,514.

Ethyl Development Corporation: *See—*
Kinslow, William G., Jr.; Marchant, Paul A.; Bessier, Robert D.; and Hafele, Robert X., 3,860,375.

Evans, David John Ivor: *See—*
Sefton, Verner Blakey; Evans, David John Ivor; and Weir, Donald Robert, 3,860,689.

Evans, Ernest C.; and Gurnee, Clarence E., to Kimberly-Clark Corporation. Cushioning material test device. 3,859,841, Cl. 73-12.000.

Evans, John L., to Chubb Fire Security Limited. Fire-fighting branch pipe nozzles. 3,860,176, Cl. 239-456.000.

Evans, Norol T., to Hughes Aircraft Company. Moving target indicator system. 3,860,924, Cl. 343-7.700.

Eveleth Taconite Company: *See—*
Urich, Daniel M., 3,860,224.

Everhart, Norman; Herman, James; and Meise, William, to Jerrold Electronics Corporation. Catv primary and auxiliary power distribution apparatus. 3,860,748, Cl. 178-6.000.

Extraktionslechnik Gesellschaft fur Anlagenbau mbH: *See—*
Kehse, Wolfgang; and Weber, Klaus, 3,860,395.

Exxon Production Research Company: *See—*
Guy, Arthur L.; and Reber, John B., Jr., 3,859,806.

Exxon Research & Engineering Co.: *See—*
Eberly, Paul E., Jr., 3,860,512.

F. & M. Schaefer Brewing Company, The: *See—*
Strandskov, Frede B.; and Bocklemann, John B., 3,860,729.

Fabbri, William C., to Keene Corporation. Fluorescent fixture auxiliary light. 3,860,829, Cl. 307-66.000.

Faessinger, Robert W.; and Roccheggiani, Guido G., to Scott Paper Company. Printing fluid. 3,860,547, Cl. 260-29.40R.

Faessinger, Robert W.: *See—*
Roccheggiani, Guido G.; and Faessinger, Robert W., 3,860,548.

Fahlman, Gosta H.: *See—*
Almquist, Hans Olof; and Fahlman, Gosta H., 3,859,994.

Fair, Raymond G., Jr., to Timesavers, Inc. Wide belt sanding machine. 3,859,758, Cl. 51-147.000.

Falk, Richard A. Molten metal stream sampler. 3,859,857, Cl. 73-425.40R.

Falkowitz, Abe I., to United States of America, Navy. Primer coating composition. 3,860,550, Cl. 260-33.6UA.

Fanto-Kuertoes, Peter Robert; and Marek, Ralf Stellan, to Continentale Linoleum Union Betriebs AG. Apparatus for the manufacture of fibers. 3,860,370, Cl. 425-72.000.

Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
Metzger, Adolf; Scholderer, Jorg; and Schreiber, Horst, 3,860,695.

Farelli, Mario. Casings for tappet rods particularly in the motor vehicle engines. 3,860,249, Cl. 277-63.000.

Farfaglia, Silvio T., to Phillips Petroleum Company. Double ratchet conveyor drive mechanism. 3,860,108, Cl. 198-203.000.

Fassman, Arnold, to Pitney-Bowes, Inc. Offset stacking mechanism. 3,860,127, Cl. 214-6.00N.

Fawcett, Sherwood L.; and Anno, James N., to Battelle Development Corporation. Method and apparatus for converting one form of energy into another form of energy. 3,859,789, Cl. 60-325.000.

Feng, Joseph Shao-Ying: *See—*
Nicolet, Marc-Aurele; Bajorek, Christopher H.; and Feng, Joseph Shao-Ying, 3,860,450.

Fenzl, Horst, to Durkoppwerke GmbH. Method of and apparatus for feeding a workpiece to a dart-forming sewing machine. 3,859,937, Cl. 112-131.000.

Ferranti Limited: *See—*
Manners-Smith, John; Thompson, Christopher Garth; and Tinning, Peter, 3,860,096.

Ferrari, Richard A., to Sterling Drug Inc. Composition and method for treatment of acne or seborrhea. 3,860,712, Cl. 424-240.000.

Ferres, Harry; and Clayton, John Peter, to Beecham Group Limited. Phthalide penicillin ester and salts. 3,860,579, Cl. 260-239.100.

Fertik, Harry A., to Leeds & Northrup Company. Control system for mold cooling in glass forming machine. 3,860,407, Cl. 65-161.000.

Feucht, Albert: *See—*
Hawley, Sumner H.; and Feucht, Albert, 3,859,881.

Feuer, Peter R.; and Rotar, Emil. Electronic baseball game. 3,860,239, Cl. 273-88.000.

Feustel, James R.; Hoyt, Kenneth L.; and Valukonis, Jonas, to Ford Motor Company. Bumper support and energy absorbing frame system for a motor vehicle. 3,860,258, Cl. 280-106.00R.

Fiala, Ernst, to Volkswagenwerk Aktiengesellschaft. Apparatus for cleaning concealable lights. 3,859,688, Cl. 15-250.010.

Fiat - Allis Construction Machinery, Inc.: *See—*
Schaffner, Donald L., 3,860,299.

Fiber Industries, Inc.: *See—*
Davis, Gerald Wayne; and Sheats, Jimmy Bernard, 3,860,560.
Shemdin, Byar Hazim, 3,860,679.

Fiber Materials, Inc.: *See—*
Lachman, Walter L.; Penty, Robert A.; and Jahn, Apul F., 3,860,443.

Fichter, Manfred; Spauszus, Siegfried; and Warkentin, Ulrich, to Kienzle Apparate GmbH. Electronic taximeter having programable constant furnishing means. 3,860,806, Cl. 235-168.000.

Fichter, Manfred; Spauszus, Siegfried; and Warkentin, Ulrich, to Kienzle Apparate GmbH. Electronic taximeter having serially energized indicator means. 3,860,807, Cl. 235-168.000.

Fiedler, Bernhard, to Maschinenfabrik Nuckau R. Wolf Aktiengesellschaft. Method of manufacturing slotted sieves. 3,859,713, Cl. 29-423.000.

Fiedler, Bernhard, to Maschinenfabrik Buckau R. Wolf Aktiengesellschaft. Centrifuge and method of operating the same. 3,860,165, Cl. 233-11.000.

Finkel, Eduard Emmanuilovich: *See—*
Shkundin, Lev Romanovich; Braginsky, Roman Pavlovich; Finkel, Eduard Emmanuilovich; and Leontiev, Jury Nikolaevich, 3,860,159.

Finkelmeier, Hans-Joachim; Domke, Klaus; and Lau, Peter, to Fr. Hesser Maschinenfabrik AG. Apparatus for flushing oxygen from bulk materials to be packaged. 3,860,047, Cl. 141-47.000.

Finley, Carl E., to Olin Corporation. Oxygen generator. 3,860,396, Cl. 23-281.000.

Firestone Tire & Rubber Company, The: *See—*
Halasa, Adel F., 3,860,602.

Firstenberg, Harold S. Endless track and mounting apparatus therefor. 3,860,080, Cl. 180-9.20R.

Firth, John Richard, to Pye Limited. Measuring attenuator for an optical null spectrophotometer. 3,860,328, Cl. 350-271.000.

Fischer, Artur. Mounting device for suspended ceilings and the like. 3,859,889, Cl. 85-79.000.

Fischer, Artur; Porlein, Gerhard; and Killgus, Theo, to Artor & Fischer. Plug-in circuit element. 3,860,323, Cl. 339-258.00R.

Fischer, Diether; Hornberger, Paul; and Wolf, Willy. Synthetic lubricants resistant to shear and cold. 3,860,522, Cl. 252-56.00S.

Fish, Barry M., to Lawrence Peska Associates, Inc., a part interest. Golf swing and device. 3,860,246, Cl. 273-183.00B.

Fishback, Alton J.: *See—*
Calvert, Rodney K.; and Fishback, Alton J., 3,859,773.

Fisons Limited: *See—*
Cairns, Hugh; Hunter, Dennis; and King, John, 3,860,617.

Fitz, Philip John, to Marconi Company Limited, The. Power supply circuits. 3,860,864, Cl. 321-18.000.

Flanary, Ellis R., to Flanary Industries, Inc. Mobile construction machine greasing assembly. 3,860,090, Cl. 184-7.00C.

Flanary Industries, Inc.: *See—*
Flanary, Ellis R., 3,860,090.

Fleck, Werner; Weinbrecht, Erwin; and Borner, Gerhard, to Robert Bosch Photokino G.m.b.H. Sound projector for motion picture film. 3,860,331, Cl. 352-14.000.

Flex-A-Court, Inc.: *See—*
Donzis, Byron A., 3,859,768.

Flex-o-Lators, Inc.: *See—*
Platt, Frederick C., 3,860,287.

Flickinger, Earl Dan; and Buess, Charles Merlyn, to Skelly Oil Company. Sandwich-type chemical compounds and method for their preparation. 3,860,610, Cl. 260-327.00B.

Flintoff, Frederick Joseph: *See—*
Harris, Norman; Flintoff, Frederick Joseph; and Reid, Robert, 3,860,534.

Flotow, David W.; and Young, John C., to Simplex Industries, Inc. Wall structure for modular or mobile homes. 3,859,766, Cl. 52-268.000.

Flucke, Winfried: *See—*
Wollweber, Hartmund; Flucke, Winfried; Schulz, Hans Peter; and Thomas, Herbert, 3,860,590.

FLUXO: *See—*
Berger, Paul C., 3,860,223.

FMC Corporation: *See—*
Besserdich, Orrin H.; and Crawford, Donald C., 3,859,898.
Ryan, Daniel J., 3,860,820.
Tryon, Sager, 3,860,527.

Folkenroth, Earl Earnest, to AMP Incorporated. Method and apparatus for manufacturing electrical harnesses. 3,859,724, Cl. 29-628.000.

Fontaine, John G., to Safe Stop Brake Corporation. Composite seat and switch with recessed contacting sheet. 3,860,773, Cl. 200-85.00A.

Foodfac Inc.: *See—*
Hatcher, Glenn, 3,859,907.

Ford Motor Company: *See—*
Allison, William D.; and Sippel, Donald G., 3,860,259.
Azelborn, Nicolas Alan; Errante, Joseph; and Paluszny, Antoni, 3,859,786.
Basler, Wayne G.; and Thompson, Robert J., 3,860,406.
Bentley, Allen J.; and Goyal, Ashok K., 3,860,362.
Darnell, Dana R.; and Harrison, Clarence E., Jr., 3,860,875.
De Grazia, Victor S., 3,859,866.
Donakowski, William A.; Morgan, John R.; and Roemming, Karl, 3,860,058.
Feustel, James R.; Hoyt, Kenneth L.; and Valukonis, Jonas, 3,860,258.
Johnson, Roger E.; and Sawai, Joe Y., 3,860,125.
Lukasik, John A.; and McCarthy, Patrick J., 3,860,353.
Marcuzzi, Anthony T., 3,859,753.
Nasson, Carl, 3,859,704.
Telang, Yeshwant P.; and Uy, James C., 3,860,367.
Tsou, Ivan H., 3,860,546.

Ford, William M., to Hewlett-Packard Company. Crystal furnace. 3,860,736, Cl. 13-20.000.

Fordsmand, Marc. Air curtain system. 3,859,900, Cl. 98-36.000.

Forenabe Fabriksverken: *See—*
Lundquist, Ulf Rolfsson, 3,860,250.

Forkner, John H., to Pillsbury Company, The. Process for the treatment of coconut and products resulting therefrom. 3,860,725, Cl. 426-44.000.

Forkner, John H., to Pillsbury Company, The. Cocoanut food product and method. 3,860,731, Cl. 426-199.000.

Formica Corporation: *See—*
Jaisle, Richard Frederick; Albrinck, Donald Joseph; and Grosheim, Gene Edward, 3,860,470.

Forni, Joseph M, to Burton, Gerald V., a part interest. Test coupling. 3,860,038, Cl. 138-94.300.

Foseco International Limited: *See—*
Ageborg, Ralf; and Beckman, Jan Olof, 3,860,059.

Fosroc A.G.: *See—*
Brown, John Vincent, 3,859,780.

Fostel, Karl. Bedside table. 3,860,307, Cl. 312-252.000.

Foster, Louis: *See—*
McCain, James Herndon, Jr.; and Foster, Louis, 3,860,656.

Foster, Walter E.: *See—*
Gautreaux, Marcelian F.; McCarthy, John H.; Foster, Walter E.; Hutchinson, Donald O.; and Frey, Frederick W., 3,860,415.
Gautreaux, Marcelian F.; McCarthy, John H.; Foster, Walter E.; Hutchinson, Donald O.; and Frey, Frederick W., Jr., 3,860,416.

Foulquies, Bernard Marie; Capell, Reginald Ernest; and Crookes, Brian, to Parema Limited. Narrow fabrics. 3,859,825, Cl. 66-192.000.

Fox, William B.: *See—*
Ratcliffe, Charles T.; Hardin, Charles V.; Anderson, Lowell R.; and Fox, William B., 3,860,660.

Foyle, Russell M.: *See—*
Sherer, C. Richard; and Foyle, Russell M., 3,859,877.

Fr. Hesser Maschinenfabrik AG: *See—*
Finkelmeier, Hans-Joachim; Domke, Klaus; and Lau, Peter, 3,860,047.

Francey, Melvin H.: *See—*
Spanke, Edwin A.; Carrieri, Louis F.; and Francey, Melvin H., 3,860,100.

Frangos, John W. Storage and retrieval system. 3,860,130, Cl. 214-16.10B.

Frank, Eli C.: *See—*
Boxer, Leo M.; and Boxer, Robert W., 3,860,133.

Frank, Robert; and Mathis, David G., to Superior Towbar Manufacturing Co., Inc. Vehicle towing apparatus. 3,860,266, Cl. 280-458.000.

Fratar, Francis J.: *See—*
Gostyn, Ernest; and Fratar, Francis J., 3,859,719.

Frayer, James A.: *See—*
Brunn, Louis W.; Frayer, James A.; and Paraskos, John A., 3,860,511.

French, Alan; and Machado, Joseph, to Avid Corporation. Passenger audio control box. 3,860,139, Cl. 220-3.500.

Frey, Frederick W.: *See—*
Gautreaux, Marcelian F.; McCarthy, John H.; Foster, Walter E.; Hutchinson, Donald O.; and Frey, Frederick W., 3,860,415.
Lee, Thomas E.; and Frey, Frederick W., 3,860,514.

Frey, Frederick W., Jr.: *See—*
Gautreaux, Marcelian F.; McCarthy, John H.; Foster, Walter E.; Hutchinson, Donald O.; and Frey, Frederick W., Jr., 3,860,416.

Frey, Gerald J.; and Peterson, Gary E., to said Frey, by said Peterson. Slide projector drive mechanism. 3,860,326, Cl. 353-109.000.

Frey, Gerald J.: *See—*
Frey, Gerald J.; and Peterson, Gary E. (assors. to said Frey, by said Peterson), 3,860,326.
Friedrich, Hubert: *See—*
Kaudewitz, Peter; and Friedrich, Hubert, 3,860,504.
Frieseke & Hopfner GmbH Erlangen-Bruck: *See—*
Bosch, Julius, 3,859,842.
Fronczek, Chester: *See—*
Lindemuth, Laurence D.; Whitehead, Donald K.; and Fronczek, Chester, 3,860,520.
Frutschi, Hansulrich, to Brown Boveri-Sulzer Turbomaschinen Aktiengesellschaft. Load control for closed cycle gas turbine. 3,859,795, Cl. 60-652.000.
Fuji Photo Film Co., Ltd.: *See—*
Akashi, Goro; Fujiyama, Masaaki; and Kasuga, Akira, 3,860,449.
Fukuda, Susumu, 3,860,941.
Ono, Yoshiaki; Yoneyama, Masakazu; Ueda, Hirozo; and Yamamoto, Nobuo, 3,860,425.
Fujitsu Limited: *See—*
Hinoshita, Shigehiko; Hagiwara, Shoji; and Sata, Naohide, 3,860,871.
Fujiyama, Masaaki: *See—*
Akashi, Goro; Fujiyama, Masaaki; and Kasuga, Akira, 3,860,449.
Fukuda, Susumu, to Fuji Photo Film Co., Ltd. Mirror shock absorbing device for single lens reflex camera. 3,860,941, Cl. 354-156.000.
Fukuhara, Shigetomi; Hayashi, Seiichi; and Tomita, Chuji, to Hitachi, Ltd. Image information retrieving device. 3,860,334, Cl. 353-27.000.
Fukushima, Isao: *See—*
Mitsui, Nobuo; Kameyama, Tadao; Watanabe, Akinori; Fukushima, Isao; and Hatakeyama, Takanobu, 3,860,093.
Fukuyama, Yosinobu, to Takatori Machinery Works Ltd. Automatic apparatus for closing the toe of a seamless stocking. 3,859,938, Cl. 112-121.150.
Fulachier, Georges Edward: *See—*
Raillere, Raymond; and Fulachier, Georges Edward, 3,860,345.
Fuller, Harlan I.: *See—*
Watson, Edwin Ben; and Fuller, Harlan I., 3,859,972.
Funck, Donald E.: *See—*
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Funk, Ernest J.: *See—*
Duffek, Edward F.; Funk, Ernest J.; Jankowski, Alfred S.; Lane, Jack C.; Lehner, William L.; Oliver, Floyd F.; and Schneider, Mark, 3,859,715.
Furstenberg, Joachim, to LTG Lufttechnische GmbH. Method of and apparatus for open-end spinning. 3,859,779, Cl. 57-58.890.
Furuya, Tadashi, to Nippon Electric Company, Limited. Microwave relay system having auxiliary signal transmission arrangement. 3,860,870, Cl. 325-3.000.
G. D. Searle & Co.: *See—*
Short, George E., 3,860,701.
G. Siempelkamp & Co.: *See—*
Pesch, Jurgen, 3,860,381.
Gaertner, George W.: *See—*
Pilgram, Kurt H.; Medema, Dirk; Soloway, Samuel B.; and Gaertner, George W., 3,860,658.
Galle, Edward M., to Hughes Tool Company. Logging method and system. 3,860,902, Cl. 340-18.0LD.
Games, John E.; Casper, Clarence, Jr.; and Kupersmith, Lertram F., to United Aircraft Corporation. Constant slew rate filtering. 3,860,877, Cl. 328-167.000.
Gamo, Hiroshi; and Kawakami, Akira. Thyristor with gold doping profile. 3,860,947, Cl. 357-38.000.
Gandi, Robert A.: *See—*
Douma, William L.; and Gandi, Robert A., 3,859,997.
Gansen, Adrian P., Jr. Dressing for dry tooth socket. 3,860,704, Cl. 424-125.000.
Garbarini, Victor Charles: *See—*
Erdman, William Charles; and Garbarini, Victor Charles, 3,860,464.
Garcia, Francisco Estepa, to Patentes Fac, S.A. Improvements in double action cylinder or circular locks, applicable to doors and similar objects. 3,859,827, Cl. 70-143.000.
Garfunkel, James H., to Honeywell Inc. Multi-component infrared analyzer. 3,860,344, Cl. 356-51.000.
Garlick, Thomas William. Method and apparatus for continuous metal casting. 3,860,057, Cl. 164-87.000.
Garnar, Thomas Edward, Jr., to du Pont de Nemours, E. I., and Company. Synthetic mineral sand produced from staurolite. 3,860,435, Cl. 106-288.00B.
Garrett, Jim C.: *See—*
Boucher, C. Wendell; and Hanneman, Thomas W., 3,860,767.
Garrison, Judd F.: *See—*
Batts, John H.; and Garrison, Judd F., 3,859,710.
Gates Rubber Company, The: *See—*
Vance, James C., Sr., 3,860,684.
Gati, Sandor: *See—*
Model, Ernst; and Gati, Sandor, 3,860,604.
Gause, Raymond L., to United States of America, National Aeronautics and Space Administration. Ergometer calibrator. 3,859,840, Cl. 73-1.00R.
Gautreaux, Marcelian F.; McCarthy, John H.; Foster, Walter E.; Hutchinson, Donald O.; and Frey, Frederick W., to Ethyl Corporation. Process for preparing aluminum. 3,860,415, Cl. 75-.50B.
Gautreaux, Marcelian F.; McCarthy, John H.; Foster, Walter E.; Hutchinson, Donald O.; and Frey, Frederick W., Jr., to Ethyl Corporation. Modified aluminum process. 3,860,416, Cl. 75-0.50B.
Gavar, Valdis Valdovich; Dindun, Alexandr Stanislavovich; Kramer, Mark Maximovich; Platatsis, Ernest Yanovich; Mikelson, Artur Eduardovich; and Tomson, Elmar Yanovich. Radiation circuit hydraulic system for nuclear reactors and the like. 3,860,825, Cl. 250-430.000.
GCO, Inc.: *See—*
Kersch, Leonard A.; and Champagne, Edwin B., 3,860,346.
Geier, Karl-Heinz; Schmidt, Dietmar; and Uhlmann, Lothar. Matrix arrangement for operating optical elements. 3,860,915, Cl. 340-173.0LS.
Geist, Thomas N.: *See—*
Ballas, George C.; and Geist, Thomas N., 3,859,776.
Gellatly, Robert K., to General Cable Corporation. Aerial lift platform leveling apparatus and system. 3,860,088, Cl. 182-2.000.
Gendron-Diemer, Inc.: *See—*
Hartman, De Witt B., 3,860,285.
General Cable Corporation: *See—*
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Armstrong, William J.; and McDowell, Donald G., Jr., 3,859,932.
Carmean, Ronald Eugene, 3,860,817.
Etherington, Ralph; and Riviere, Henry W., 3,860,881.
Khuzaje, Kamel A., 3,859,853.
Kipp, Frederick M., 3,859,903.
Noble, Milton L.; and Schindler, Edmund H., 3,860,399.
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Watrous, Donald L., 3,860,856.
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General Motors Corporation: *See—*
Anderson, Robert D.; and Troth, Dennis L., 3,859,787.
Canter, James A., 3,859,813.
Colautti, Albert J., 3,860,283.
Haglund, Robert J.; and Zimmer, Thomas R., 3,860,366.
Konantz, Mark L.; and Leisure, Ronald K., 3,860,448.
Yu, Mason K., 3,860,360.
Gens, Theodore A., to United States of America, Atomic Energy Commission. Actinide mononitride microspheres and process. 3,860,691, Cl. 423-254.000.
George Kent Limited: *See—*
Johnson, Peter Alan, 3,860,867.
Georges, Michael P. Sheet transport and flattening apparatus. 3,860,230, Cl. 271-3.000.
Gerard, Rene: *See—*
Bouygues, Jean; and Gerard, Rene, 3,860,124.
Geri, Don W., to Primark Corporation. Marking gun tape supply. 3,860,191, Cl. 242-68.500.
Gertsch AG: *See—*
Schweizer, Gottfried, 3,860,253.
Gewerkschaft Eisenhutte Westfalia: *See—*
Weirich, Walter, 3,859,801.
Gidaspow, Dimitri, to Institute of Gas Technology. Suppression of nitric oxide. 3,860,690, Cl. 423-239.000.
Gigiou, Claude: *See—*
Chabert, Henri; Aime, Robert; Gigiou, Claude; and Ruaud, Michel, 3,860,568.
Gilbert, Anthony F.; and Munsey, John H., to Coast Marine Associates, Inc. Sound suppression hood assembly. 3,860,085, Cl. 181-33.00K.
Gilboy, Joseph J. Electrical impulse counter for automatic car wash and the like. 3,860,797, Cl. 235-92.0PD.
Gillies, Wallace: *See—*
Gleason, Charles H.; Bamford, Allan J.; and Gillies, Wallace, 3,860,845.
Gilliom, John W., to Tappan Company, The. Oven door lock. 3,859,979, Cl. 126-197.000.
Gillmer, Arnold H., to Hughes Aircraft Company. High compression ratio pulse forming system. 3,860,926, Cl. 343-17.2PC.
Gilman, William S.: *See—*
Rubino, Andrew M.; Gilman, William S.; and Jones, John L., 3,860,705.
Gilson Bros. Co.: *See—*
Enters, Edward W.; and Detjen, Edgar W., 3,860,181.
Ginn, David W.: *See—*
Ott, Owen J.; and Ginn, David W., 3,859,959.
Ginnasi, Alessandro; and Rescalli, Carlo, both of, to Snam Progetti, S.p.A. Process for the recovery of isoprene from mixtures containing the same. 3,860,496, Cl. 203-28.000.
Giorgio, Giacomo: *See—*
Leonardo, Onofrio; Giorgio, Giacomo; and Esposito, Francesco, 3,860,607.
Giovanni, Sesto S.: *See—*
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Girard, Philippe: *See—*
Chretien, Gilbert; Girard, Philippe; Lamy, Jean-Marc; and Menard, Christophe, 3,860,555.
Girling Limited: *See—*
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Givaudan Corporation: *See—*
Easter, William M., Jr.; Dorsky, Julian; and Tavares, Robert F., 3,860,657.
Kitchens, Garry C., 3,860,635.

Nikawitz, Edward, 3,860,645.

Gleason, Charles H.; Bamford, Allan J.; and Gillies, Wallace, to Westinghouse Electric Corporation. Long life proportional counter radiation detector. 3,860,845, Cl. 313-61.00D.

Gleason, John G.; Holden, Kenneth G.; and Yim, Nelson C. F., to SmithKline Corporation. Process for the preparation of n-acyl-4-hydroxyphenylglycines. 3,860,631, Cl. 260-471.00C.

Gleason Works, The: *See—*
Howlett, Mason M., 3,859,863.

Global Wool Investments Limited: *See—*
Howe, James Henry, 3,860,530.

Goettl, William H. Combination refrigeration and evaporative cooling air conditioner. 3,859,818, Cl. 62-311.000.

Goff, Richard E., Jr.; Priestley, Joseph A.; and Staffier, Thomas L., to Johnson & Johnson. Gossamer shoulder strap for brassieres. 3,860,046, Cl. 139-421.000.

Goings, Harford E. Side splash guard for trailer trucks and wheels of a road vehicle. 3,860,262, Cl. 280-154.50R.

Goldhammer, Albert. Method and apparatus for destroying documents. 3,860,180, Cl. 241-27.000.

Goldman, Alex, to Spang Industries, Inc. High permeability manganese-zinc ferrites. 3,860,524, Cl. 252-62.620.

Gontarenko, Alexandr Nikolaevich: *See—*
Krylov, Alexandr Iosifovich; Myshko, Vladimir Semenovich; Smirnov, Leonid Stepanovich; Maslennikov, Jury Ivanovich; Vikulov, Igor Makarovich; Gontarenko, Alexandr Nikolaevich; Korovyanko, Alexandr Dmitrievich; and Zaitsev, Valery Pavlovich, 3,859,824.

Gonzalez, Hector. Hand held image design reflector. 3,860,324, Cl. 350-5.000.

Goodyear Aerospace Corporation: *See—*
Lovich, John W.; Meller, Oscar W.; and Morse, Frank C., 3,860,138.

Gopal, Raj; and Carteus, Marc F. M., to Westinghouse Electric Corporation. Metal impact monitor. 3,860,481, Cl. 176-19.00R.

Gopal, Raj: *See—*
Carteus, Marc F. M.; Gopal, Raj; and Rawle, Derek T., 3,860,480.

Gordon, Frank, Jr., to Welco Industries, Inc. Electrical slip coupling. 3,860,312, Cl. 339-4.000.

Gorling, Karl Goran; and Wiklund, Johan Elof, to Boliden Aktiebolag. Method for agglomerating fine-grain iron oxide material. 3,860,413, Cl. 75-3.000.

Goser, Karl, to Siemens Aktiengesellschaft. Logic circuit, in particular a decoder, with redundant elements. 3,860,831, Cl. 307-204.000.

Gosho, Kazuhiro: *See—*
Tanaka, Yuji; Takaoka, Matsuo; and Gosho, Kazuhiro, 3,860,878.

Gostyn, Ernest; and Fratar, Francis J., to General Instrument Corporation. Method of making a toroidal core-coil combination with in situ molded end rings. 3,859,719, Cl. 29-605.000.

Goulart, Paul R.: *See—*
Berardinelli, John D.; and Goulart, Paul R., 3,860,210.

Gould Inc.: *See—*
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Goyal, Ashok K.: *See—*
Bentley, Allen J.; and Goyal, Ashok K., 3,860,362.

Grable, Dillon Ross. Tone generator. 3,859,884, Cl. 84-1.010.

Graef, John N., to Realist, Inc. Microfiche reader. 3,860,333, Cl. 353-24.000.

Graham, Earl R.; Lagermasini, Joseph P.; Shaner, Kenneth H.; and Hopkins, David H., to GTE Sylvania Incorporated. Electroplating apparatus and method. 3,860,499, Cl. 204-15.000.

Graham, John C., to Hooker Chemicals & Plastics Corporation. Production of cyclic phosphonitrilic chloride polymers. 3,860,693, Cl. 423-300.000.

Graham, Neil Bonnette; Henbest, Richard George Cleveland; and Hutchinson, Francis Gowland, to Imperial Chemical Industries Limited. Process for preparing a foamed shaped article. 3,860,537, Cl. 260-2.5AN.

Grainger, Lewis M. D. Rotary steam engine. 3,860,357, Cl. 415-152.00R.

Grant, George R.: *See—*
Orloff, Kenneth L.; Grant, George R.; and Gunter, William D., Jr., 3,860,342.

Grant, Whitney I., to Vilter Manufacturing Corporation. Variable capacity rotary screw compressor. 3,859,814, Cl. 62-196.000.

Grassmayr, Klaus: *See—*
Bretschneider, Hermann; Grassmayr, Klaus; Hohenlohe-Oehringen, Kraft; and Grussner, Andre, 3,860,724.

Green, Lane A., to Superior Iron Works & Supply Company, Inc. Self loading reel carrier. 3,860,193, Cl. 242-86.50R.

Green, Robert D.; and Heimbigner, Gary L., to Rockwell International Corporation. Method of manufacturing control electrodes for charge coupled circuits and the like. 3,859,717, Cl. 29-571.000.

Green, Thomas N. Dual valve snorkel. 3,860,042, Cl. 128-145.00A.

Greenham, Stanley Keith: *See—*
Roe, Malcolm David; Donald, John Henry; Chappell, Peter Lee; Kirk, Malcolm; Edwards, John David; and Greenham, Stanley Keith, 3,860,793.

Greenwood, Mark E.: *See—*
Bartlow, David H.; and Greenwood, Mark E., 3,860,478.

Gregg, Woodrow W. Ball bearing assembly. 3,860,302, Cl. 308-187.000.

Gregorian, Razmic S.; and Hoernle, Hans R., to United Merchants and Manufacturers, Inc. Method of making a leather-like texturized laminate. 3,860,469, Cl. 156-83.000.

Grieb, Paul E.; and Sieradzki, Richard. Control system for grinding machine. 3,859,760, Cl. 51-165.750.

Grilli, Walter, to AMF Incorporated. Pneumatic tobacco feed system. 3,860,031, Cl. 137-610.000.

Grisar, J. Martin; and Parker, Roger A., to Richardson-Merrell Inc. Hypolipidemic agents. 3,860,722, Cl. 424-308.000.

Gronwald, Frederick Christian: *See—*
Christensen, Haldor; Lundt, Behren M. Freidrich; Gronwald, Frederick Christian; and Andersen, William, 3,860,619.

Grosheim, Gene Edward: *See—*
Jaisle, Richard Frederick; Albrinck, Donald Joseph; and Grosheim, Gene Edward, 3,860,470.

Grout, Kenneth M., to Kenics Corporation. Shear mixer. 3,860,217, Cl. 259-4.000.

Grove, Marvin H.; and Dunegan, Ronald G., to M & J Valve Company. Flow diverting apparatus and method. 3,860,033, Cl. 137-625.500.

Grubber, Michael J., to S. C. Johnson & Son. Synergistic insecticidal composition containing dipropargyl phenylphosphonate. 3,860,711, Cl. 424-200.000.

Grussner, Andre: *See—*
Bretschneider, Hermann; Grassmayr, Klaus; Hohenlohe-Oehringen, Kraft; and Grussner, Andre, 3,860,724.

GTE Automatic Electric Laboratories Incorporated: *See—*
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GTE Lenkurt Incorporated: *See—*
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GTE Sylvania Incorporated: *See—*
Graham, Earl R.; Lagermasini, Joseph P.; Shaner, Kenneth H.; and Hopkins, David H., 3,860,499.
Latassa, Frank M.; Milke, Howard W.; and Sadoski, Tadius T., 3,860,852.
Moscatello, Charles L., 3,860,737.

Gucker, George C., to Potter Instrument Company, Inc. Disk drive head positioning servo including temperature responsive safety means. 3,860,861, Cl. 318-473.000.

Guenther, Lloyd M., to Chevron Research Company. Jet means in a thermoplastic yarn rebound texturizing apparatus. 3,859,696, Cl. 28-1.400.

Guenther, Lloyd M., to Chevron Research Company. Foraminous surface means in a thermoplastic yarn rebound texturizing apparatus. 3,859,697, Cl. 28-1.400.

Guerini, Mario. Speed indicator and speed signalling device for vehicles in general. 3,860,905, Cl. 340-62.000.

Guillet, James Edwin; and Troth, Harvey Graham. Photodegradable polymer masterbatches. 3,860,538, Cl. 260-2.5HA.

Gulf Research & Development Company: *See—*
Brunn, Louis W.; Frayer, James A.; and Paraskos, John A., 3,860,511.
Cooper, Peter Garfield, III, 3,860,488.
Cooper, Peter Garfield, III, 3,860,489.
Covey, Michael F., 3,860,720.
Henke, Alfred M.; and McKinney, Joel D., 3,860,510.

Gulf & Western Manufacturing Company: *See—*
Spanke, Edwin A.; Carrieri, Louis F.; and Francey, Melvin H., 3,860,100.

Gum, Wilson F., Jr.: *See—*
Anderson, Gene A.; Bailey, Robert E.; and Gum, Wilson F., Jr., 3,860,663.

Gunnebo Bruks Aktiebolag: *See—*
Engstrom, Per Ingemar; and Boye, Erhard Rudolf, 3,860,161.

Gunning, Stephen Raymond: *See—*
Hartley, Philip Saxton; and Gunning, Stephen Raymond, 3,860,618.

Gunter, William D., Jr.: *See—*
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Gurnee, Clarence E.: *See—*
Evans, Ernest C.; and Gurnee, Clarence E., 3,859,841.

Gust, William H., to United States of America, Atomic Energy Commission. Method for producing refractory carbide coatings on graphite. 3,860,437, Cl. 117-46.0CC.

Gust, William H.; Heckman, Richard A.; and Voreck, Wallace E., Jr., to United States of America, Atomic Energy Commission. Method for producing refractory carbide coatings on graphite. 3,860,445, Cl. 117-118.000.

Guthart, Leo A., to Alarm Device Manufacturing Company. Article for carrying and concealably supporting a container. 3,860,207, Cl. 248-27.000.

Guthrie, William D., to United States of America, Army. Traveling tube ejector system. 3,859,890, Cl. 89-1.800.

Guttag, Alvin, to National Patent Development Corporation. Process of subjecting a microorganism susceptible material to a microorganism. 3,860,490, Cl. 195-108.000.

Guy, Arthur L.; and Reber, John B., Jr., to Exxon Production Research Company. Offshore platform. 3,859,806, Cl. 61-46.500.

Gysling, Henry J., to Eastman Kodak Company. Photosensitive copper (i) complexes and the use thereof in photographic development. 3,860,500, Cl. 204-15.000.

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Habermeier, Jurgen; Buxbaum, Lothar; Porret, Daniel; and Batzer, Hans, to Ciba-Geigy Corporation. Linear homopolyesters and copolyesters based on bis(hydroxyalkyl)benzimidazolones. 3,860,564, Cl. 260-75.00N.

Hack, Richard Charles: *See—*
Bye, Gerald Charles; Hack, Richard Charles; and Pennell, Anthony Robin, 3,860,681.
Hafele, Robert X.: *See—*
Kinslow, William G., Jr.; Marchant, Paul A.; Bessier, Robert D.; and Hafele, Robert X., 3,860,375.
Hagan, William K.: *See—*
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Hagen, Hans: *See—*
Moll, Hans; and Hagen, Hans, 3,860,081.
Hagianis, Ernest John, to Scovill Manufacturing Company. Childproof actuator. 3,860,149, Cl. 222-153.000.
Hagiwara, Shoji: *See—*
Hinoshita, Shigehiko; Hagiwara, Shoji; and Sata, Naohide, 3,860,871.
Haglund, Robert J.; and Zimmer, Thomas R., to General Motors Corporation. Rotary engine. 3,860,366, Cl. 418-61.00A.
Haigh, John M. Disperse dye transfer through polyolefin release layer to non-porous thermoplastic sheet dyed thereby. 3,860,388, Cl. 8-2.500.
Haines, Virginia E.; and Albright, William F. Bicycle pedal attachment. 3,859,867, Cl. 74-563.000.
Hajos, Zoltan G.; and Parrish, David R., to Hoffmann-La Roche Inc. Perfume and flavored compositions containing ethyl 2,4-dioxohexanoate. 3,860,727, Cl. 426-65.000.
Hakansson, Sven Anders Samuel, to Kommanditbolaget United Stirling (Sweden) AB & Co. Device for governing the temperature of a heater head of a hot gas engine. 3,859,794, Cl. 60-524.000.
Halasa, Adel F., to Firestone Tire & Rubber Company, The. Hydrazinium salts of mercaptobenzothiazole. 3,860,602, Cl. 260-306.000.
Halcon International, Inc.: *See—*
Becker, Mitchell; and Khoobiar, Sargis, 3,860,650.
Kollar, John, 3,860,662.
Haldemann, Paul R.: *See—*
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Hall, Douglas E.: *See—*
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Hall, Hugh John, to Syntex (U.S.A.) Inc. X-ray diffractometer having means for cooling crystal mounted thereon. 3,860,815, Cl. 250-272.000.
Hall, Ralph H. Hot air balloon maneuvering valve. 3,860,201, Cl. 244-99.000.
Hallock, Donald D.: *See—*
Malone, James T.; Brennan, Richard L.; and Hallock, Donald D., 3,860,874.
Ham, George E.; and Temer, Don J., to Dow Chemical Company, The. N-substitued -tetra-azacyclotetradecanes. 3,860,576, Cl. 260-239.0BC.
Hamanaka, Ernest S.: *See—*
Carroll, Ronnie D.; Hamanaka, Ernest S.; Pirie, Donald K.; and Welch, Willard M., Jr., 3,860,585.
Hamba-Maschinenfabrik Hans A. Muller, Firma: *See—*
Bausch, Franz Hubert, 3,859,774.
Hamby, Bill Lee, to Sterling Electronics Corporation. Welding machine. 3,860,782, Cl. 219-89.000.
Hamer, Colin A.; Loro, Alberto; and Payne, John R., to Microsystems International Limited. Bonding ethod for multiple chip arrays. 3,859,723, Cl. 29-626.000.
Hamersma, Willem Antonius Maria, to U.S. Philips Corporation. Gauze electrode for a cathode-ray tube. 3,860,851, Cl. 313-456.000.
Hamling, Bernard H., to Union Carbide Corporation. Stabilized tetragonal zirconia fibers and textiles. 3,860,529, Cl. 252-301.10R.
Hammann, Ingeborg: *See—*
Stolzer, Claus; Hammann, Ingeborg; and Unterstenhofer, Gunther, 3,860,646.
Hammann, William C.; and Schisla, Robert M., to Monsanto Company. Phenoxybiphenyl compounds. 3,860,661, Cl. 260-613.00R.
Hammar, Walton James, to Riker Laboratories, Inc. 8-Aminoalkyl substituted dibenzobicyclo [3.2.1] octadienes. 3,860,652, Cl. 260-570.900.
Hammerschlag, Peter G. Under load releasable chain stoppers. 3,859,946, Cl. 114-200.000.
Hammes, Paul A.: *See—*
Morse, Lewis D.; and Hammes, Paul A., 3,860,733.
Hampy, Vere S.: *See—*
Morin, Marius J.; Hegel, James D.; Hampy, Vere S.; and Shield, Richard L., 3,859,749.
Hamy, Norbert, to Trebron Holdings Limited. Transport systems. 3,859,923, Cl. 104-23.0FS.
Hanneman, Thomas W.: *See—*
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Hansen, Hans; Hauffe, Dieter; Hehn, Karl-Heinz; Nuss, Karl-Heinz; Rausch, Werner; Rothkegel, Josef; and Wimmers, Peter, to Oxy Metal Finishing Corporation. Method for phosphatizing ferrous surfaces. 3,860,455, Cl. 148-6.15R.
Hanson, Charles C., to International Business Machines Corporation. Offset read/write magnetic recording system with guard band. 3,860,958, Cl. 360-57.000.
Hanson, Walter F.: *See—*
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Harao, Norio: *See—*
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Hardesty, Edwin Charles, to Western Electric Company, Incorporated. Electrical connecting devices for terminating cords and methods of assembling the devices to cords. 3,860,316, Cl. 339-91.00R.
Hardin, Charles V.: *See—*
Ratcliffe, Charles T.; Hardin, Charles V.; Anderson, Lowell R.; and Fox, William B., 3,860,660.
Harle, Cyril Dawson: *See—*
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Harrell, Wade H.: *See—*
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Harris, Derek Percival: *See—*
McMurtry, David Roberts; and Harris, Derek Percival, 3,860,361.
Harris, Norman; Flintoff, Frederick Joseph; and Reid, Robert, to Power-Gas Limited. Method of making an antimony-vanadium catalyst. 3,860,534, Cl. 252-461.000.
Harrison, Clarence E., Jr.: *See—*
Darnell, Dana R.; and Harrison, Clarence E., Jr., 3,860,875.
Harrison, Ronnie M.: *See—*
Tallent, Michael W.; Scaggs, Lee E.; Swain, Allan L.; Harrison, Ronnie M.; and Hendershot, William B., III, 3,860,952.
Hart, Porter; and Hatch, Asa Elliott. Method of recovering mineral values from ore. 3,860,513, Cl. 209-1.000.
Hartley, Philip Saxton; and Gunning, Stephen Raymond. Chromone. 3,860,618, Cl. 260-345.200.
Hartman, De Witt B., to Gendron-Diemer, Inc. Combined wheelchair, tray and foot rest. 3,860,285, Cl. 297-150.000.
Hartz, Billy J. Transportation system. 3,859,925, Cl. 104-88.000.
Harvey, Donald M., to Eastman Kodak Company. Shutter control circuit for controlling exposure time under low light conditions. 3,860,936, Cl. 354-51.000.
Hatakeyama, Takanobu: *See—*
Mitsui, Nobuo; Kameyama, Tadao; Watanabe, Akinori; Fukushima, Isao; and Hatakeyama, Takanobu, 3,860,093.
Hatch, Asa Elliott: *See—*
Hart, Porter; and Hatch, Asa Elliott, 3,860,513.
Hatcher, Glenn, to Foodfac Inc. Boiled egg desheller. 3,859,907, Cl. 99-570.000.
Hatten, Jostein; and Johnsen, Ole H., to Nordic International Co. Snow gripper for a vehicle tire. 3,860,053, Cl. 152-226.000.
Hatz, Ernst; and Schmuck, Johann, to Motorenfabrik Hatz KG. Internal combustion engine with silencing means. 3,859,965, Cl. 123-41.700.
Hauffe, Dieter: *See—*
Hansen, Hans; Hauffe, Dieter; Hehn, Karl-Heinz; Nuss, Karl-Heinz; Rausch, Werner; Rothkegel, Josef; and Wimmers, Peter, 3,860,455.
Hausen, Volker Wilhelm: *See—*
Knof, Hans Kurt; Krafft, Hermann Dietrich; and Hausen, Volker Wilhelm, 3,860,848.
Hawk, Bob R., to Loma Corporation. Self-hinging cover for container. 3,860,141, Cl. 220-338.000.
Hawley, Sumner H.; and Feucht, Albert, to Lewis Machine Company, a division of Wyle Laboratories. Stock cutting apparatus. 3,859,881, Cl. 83-320.000.
Haworth, Gordon R.: *See—*
McCain, David L.; Haworth, Gordon R.; and Umphrey, Ronald W., 3,860,027.
Hayashi, Seiichi: *See—*
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Hayashida, Hajime, to Nippon Gakki Seizo Kabushiki Kaisha. Bushing structure for use in piano action. 3,859,885, Cl. 84-251.000.
Haybuster Manufacturing Inc.: *See—*
Anderson, Joseph A.; and Neukom, Chester G., 3,860,010.
Headle, Herbert W., Jr., to United States of America, Navy. Deflection angle plotter. 3,860,791, Cl. 235-61.50T.
Heaton, Joe. Vehicle parking instruction curb device. 3,859,738, Cl. 35-11.000.
Heckman, Richard A.: *See—*
Gust, William H.; Heckman, Richard A.; and Voreck, Wallace E., Jr., 3,860,445.
Heenan, Sidney A., to Amerace Esna Corporation. One-piece support. 3,860,213, Cl. 248-466.000.
Heesemann, Karl. Grinding machine with belts. 3,859,757, Cl. 51-138.000.
Hegar, Gert; and Ramanathan, Visvanathan, to Ciba-Geigy AG. Basic anthraquinone dyestuffs. 3,860,620, Cl. 260-378.000.
Hegel, James D.: *See—*
Morin, Marius J.; Hegel, James D.; Hampy, Vere S.; and Shield, Richard L., 3,859,749.
Hehn, Karl-Heinz: *See—*
Hansen, Hans; Hauffe, Dieter; Hehn, Karl-Heinz; Nuss, Karl-Heinz; Rausch, Werner; Rothkegel, Josef; and Wimmers, Peter, 3,860,455.
Heiba, El Ahmadi I.; and Dessau, Ralph M., to Mobil Oil Corporation. Preparation of polycyclic ketones. 3,860,612, Cl. 260-332.30P.
Heimbigner, Gary L.: *See—*
Green, Robert D.; and Heimbigner, Gary L., 3,859,717.
Hek Manufacturing Company, Inc.: *See—*
Rasmussen, Keith O., 3,860,286.
Heller, William C., Jr.: *See—*
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Hellerbach, Joseph, to Hoffmann-La Roche Inc. Substituted 2-(phenyl)-cyclohexanones. 3,860,653, Cl. 260-590.000.

Helms, Charles Robert, to Container Corporation of America. Carrier having reinforced handle member. 3,860,113, Cl. 206-185.000.

Hemlab A.G.: *See—*
Corbett, Dennis Thomas, 3,860,526.

Hemsath, Klaus H.; Schmidt, Harry Dean; and Thekdi, Arvind C., to Midland-Ross Corporation. Direct fired furnace. 3,860,221, Cl. 266-5.000.

Henbest, Richard George Cleveland: *See—*
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Hendershot, William B., III: *See—*
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Henderson, Larry D.: *See—*
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Henke, Alfred M.; and McKinney, Joel D., to Gulf Research & Development Company. Combination residue hydrodesulfurization and zeolite riser cracking process. 3,860,510, Cl. 208-61.000.

Hennig, Fridolin, to Agfa-Gevaert Aktiengesellschaft. Container for photographic roll film. 3,860,942, Cl. 354-275.000.

Hennig, Fridolin: *See—*
Zobel, Siegfried; Spinnler, Rainer; Ehgartner, Gabriele; and Hennig, Fridolin, 3,860,938.

Henrick, Clive A.; and Staal, Gerardus B., to Zoecon Corporation. Cyclopropanemethyl esters. 3,860,629, Cl. 260-470.000.

Henricksen, Evan R. Apparatus and method for cleaning swimming pools. 3,860,518, Cl. 210-65.000.

Hensiek, Fred, Jr. Protective shroud for overhead door tension spring. 3,860,226, Cl. 267-69.000.

Herbethon Toy Corporation: *See—*
Blue, Walter L., 3,859,748.

Herce, John A.; and Tuttle, Robert N., to Shell Oil Company. Aluminate-thickened well treating fluid and method of use. 3,860,070, Cl. 166-292.000.

Herman, Daniel F.; and Simone, Dominic. Thermoplastic film forming composition containing titanium dioxide microvoids. 3,860,545, Cl. 260-29.6RB.

Herman, James: *See—*
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Hermann C. Starck Berlin: *See—*
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Herve, Jean-Yves: *See—*
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Herzog, Friedrich; and Twaroch, Franz. Beamsplitter and vertically illuminated fluorescent microscope using the same. 3,860,813, Cl. 350-91.000.

Hess, Robert E.: *See—*
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Hetzel, Max, to Societe Suisse pour L'Industrie Horlogere Management Services SA. Low friction miniature gear drive for transmitting small forces. 3,860,844, Cl. 310-104.000.

Hewlett-Packard Company: *See—*
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Hickman, Kenneth C. D., to United States of America, Interior. Process for producing and maintaining purified, sterile water. 3,860,494, Cl. 203-10.000.

Hidaka, Sadahiko: *See—*
Terakawa, Takashige; and Hidaka, Sadahiko, 3,860,933.

Higa, James Z. Tool kit and method for making paper sculpture articles. 3,859,897, Cl. 93-84.0TW.

Higuchi, Noboru; Ogawa, Yutaka; and Takeuchi, Soji, to NGK Insulators, Ltd. Porcelain electric insulator. 3,860,432, Cl. 106-46.000.

Hikota, Toyoniko: *See—*
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Hill, Paul R.; and Thomas, David F., Jr., to United States of America, National Aeronautics and Space Administration. Kinesthetic control simulator. 3,859,736, Cl. 35-12.00C.

Hines, David M. Oil refining device. 3,859,975, Cl. 123-196.00A.

Hinkley, David F.; and Conn, John B., to Merck & Co., Inc. 5-Fluoro-2-methyl 1-(4'-methylsulfinylbenzylidene)-3-indenyl ethanol. 3,860,659, Cl. 260-607.00A.

Hinman, Bruce E.; Cinque, Gregory M.; and Soltow, William D., Jr., to Pitney-Bowes, Inc. Electronic combination lock and lock system. 3,860,911, Cl. 340-149.00R.

Hinoshita, Shigehiko; Hagiwara, Shoji; and Sata, Naohide, to Fujitsu Limited. Phase control system for demodulation carrier in carrier band multilevel signal transmission. 3,860,871, Cl. 325-38.00B.

Hintenberger, Karl. Firing oven for ceramic material. 3,860,738, Cl. 13-31.000.

Hiramatsu, Yukio, to Varian Associates. Microwave waveguide window having the same cutoff frequency as adjoining waveguide section for an increased bandwidth. 3,860,891, Cl. 333-21.00R.

Hirosawa, Koichiro: *See—*
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Hirose, Kimiharu: *See—*
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Mitsui, Nobuo; Kameyama, Tadao; Watanabe, Akinori; Fukushima, Isao; and Hatakeyama, Takanobu, 3,860,093.
Ono, Minoru; Momoi, Toshimitsu; and Kawachi, Youji, 3,860,948.
Takada, Shohei, 3,860,745.
Ueda, Seiichi, 3,860,750.

Hoag, Ethan D.; and Locke, Edward V., to Avco Corporation. Electrically excited high power flowing gas devices such as lasers and the like. 3,860,887, Cl. 331-94.5PE.

Hochbrueckner, Martin A. Television antenna for motor home with collapsible support. 3,860,932, Cl. 343-713.000.

Hochiki Corporation: *See—*
Takeuchi, Takeshi, 3,860,746.

Hochuli, Urs; and Haldemann, Paul R., to University of Maryland, The. Method of fabricating a gas laser. 3,860,310, Cl. 316-26.000.

Hodgkinson, Ronald: *See—*
Warwicker, Eric Albert; and Hodgkinson, Ronald, 3,860,680.

Hodgson, Brian, to Machine Tool Divisional Services Limited. Gear hobbing machines. 3,859,893, Cl. 90-4.000.

Hoernle, Hans R.: *See—*
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Hoffman, Elmer. Knee-action device for snow vehicles. 3,860,079, Cl. 180-5.00R.

Hoffman, Martin: *See—*
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Hoffmann-La Roche Inc.: *See—*
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Hajos, Zoltan G.; and Parrish, David R., 3,860,727.
Hellerbach, Joseph, 3,860,653.
Kaiser, Ado; Koch, Wolfgang; Scheer, Marcel; and Wolcke, Uwe, 3,860,630.
Rey-Bellet, Gerald; and Spiegelberg, Hans, 3,860,615.

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Pommer, Horst; Reif, Werner; Pasedach, Heinrich; and Hoffmann, Werner, 3,860,655.

Hoffsommer, Robert D.; and Taub, David, to Merck & Co., Inc. Synthesis of d,l-zearalanol. 3,860,616, Cl. 260-343.20F.

Hofstetter, Carmen: *See—*
Kling, Alfred; Specht, Viktor; Hofstetter, Carmen; and Eisenberg, Gundolf, 3,860,391.

Hohenlohe-Oehringen, Kraft: *See—*
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Holcomb, William P.: *See—*
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Holden, John C.: *See—*
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Holden, Kenneth G.: *See—*
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Hollister, Donald D. Method for using metallic halides for light production in electrodeless lamps. 3,860,854, Cl. 315-248.000.

Holmes, Hedley Nixon. Telephone index device. 3,859,744, Cl. 40-336.000.

Holmes, William O. Portable hoisting and evacuation apparatus. 3,860,092, Cl. 187-6.000.

Holstad, Harald. Mirror, particularly for examination of cavities, for example, surgical mirrors or dental mirrors. 3,859,987, Cl. 128-21.000.

Holtgrieve, Thomas J.: *See—*
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Holzhauser, Ronald Charles; and Kosarko, Gerald Julius, to Eastman Kodak Company. Disabling device for an anti-backup mechanism in a film cartridge. 3,860,195, Cl. 242-194.000.

Honeywell Inc.: *See—*
Garfunkel, James H., 3,860,344.
Pedersen, Richard A., 3,860,836.
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Honeywell Information Systems Inc.: *See—*
Chow, Ling George; and Vysniauskas, Jonas K., 3,860,895.
Stratton, Lee N., III, 3,860,908.

Hong, Enrique, to Miles Laboratories, Inc. Method of antihypertensive chemotherapy utilizing 1-methyl-3-4-phenyl quinuclidinium salts. 3,860,717, Cl. 424-267.000.

Honkanen, Erkki Juhani; and Teppo, Anna Maija, to Orion-Yhtyma Oy. Method for cross-linking agarose or agar. 3,860,573, Cl. 260-209.00R.

Hooker Chemicals & Plastics Corporation: *See—*
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Hoomes, William A.: *See—*
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Hopkins, David H.: *See—*
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Hoppe, Joachim A.: *See—*
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Hornberger, Paul: *See—*
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Horton, Catherine: *See—*
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Horton, Lawrence R.; Jackson, Charles A.; Holcomb, William P.; and Horton, Catherine. Coaxial tube coupler assembly. 3,860,269, Cl. 285-47.000.

Horvath, John C.: *See—*
Martin, Thomas E.; and Horvath, John C., 3,860,678.

Hosemann, John Henry, to Ideal Aerosmith, Inc. Clutch assembly for hybrid analog-to-digital converter. 3,860,102, Cl. 192-66.000.
Hoshino, Hiroshi. Method of manufacturing non-glutinous rice crackers. 3,860,735, Cl. 426-458.000.
Hostettler, Hans: *See—*
Abel, Heinz; Hostettler, Hans; Berger, Alfred; Toepfl, Rosemarie; and Maeder, Arthur, 3,860,540.
Hougen, Everett D. Annular hole cutter. 3,860,354, Cl. 408-206.000.
Houlihan, William J.; and Nadelson, Jeffrey, to Sandoz Wander, Inc. Lithiated n-benzyl benzamides. 3,860,649, Cl. 260-566.00F.
Howe, James Henry, to Global Wool Investments Limited. Depilatory composition for removing fibers from animal skins. 3,860,530, Cl. 252-363.500.
Howell, Robert B. Presser foot with flex feature. 3,859,939, Cl. 112-235.000.
Howlett, Mason M., to Gleason Works, The. Assembly for rotating a flywheel, for short, incremental distances. 3,859,863, Cl. 74-142.000.
Hoyer, Otto, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Arrangement at a continuous casting plant. 3,860,061, Cl. 164-153.000.
Hoyt, Kenneth L.: *See—*
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Hruby, Ronald J., to Material Metrics, Inc. Sealed container pressure gauging apparatus and method. 3,859,844, Cl. 73-45.400.
Huber, Norbert; Nissler, Siegfried; and Schneider, Hans, to Autopan Heimerdinger & Stabler OHG, Firma. Apparatus for the fluid treatment of photographic sheet material wherein the latter is passed along an array of rollers. 3,860,944, Cl. 354-324.000.
Huber, Raymond B., to Armstrong Cork Company. Bonding of rubber to magnesium and its alloys. 3,859,701, Cl. 29-132.000.
Hubler, Peter, to Sulzer Brothers Ltd. Valve system. 3,860,029, Cl. 137-487.500.
Hudson, David S. Electrical switch system for a house or the like. 3,860,910, Cl. 340-147.00R.
Huffaker, Norman L. Soaker hose. 3,860,177, Cl. 239-450.000.
Huggett, Richard W. Safety rail apparatus. 3,860,089, Cl. 182-4.000.
Hughes Aircraft Company: *See—*
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Gillmer, Arnold H., 3,860,926.
Janney, Gary M.; and Senf, Henry R., 3,860,343.
Hughes, Desmond Francis. Springs. 3,860,227, Cl. 267-103.000.
Hughes Tool Company: *See—*
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Huignard, Jean-Pierre: *See—*
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Hunkar, Denes B. Injection molding control. 3,860,801, Cl. 235-151.100.
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Hunt, Ronald Eugene; and Jenkins, William Melchior, to International Business Machines Corporation. Record member apparatus. 3,860,248, Cl. 274-1.00R.
Hunter, Alexander, to Decision Data Computer Corporation. Ink roll cartridge. 3,859,915, Cl. 101-103.000.
Hunter, Dennis: *See—*
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Hurlimann, Hans P. Treatment apparatus for compositions of matter. 3,860,218, Cl. 259-98.000.
Husa, Ronald G., to United States of America, Atomic Energy Commission. Temperature stable rc oscillator. 3,860,890, Cl. 331-111.000.
Hussel, Reinmar: *See—*
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Gautreaux, Marcelian F.; McCarthy, John H.; Foster, Walter E.; Hutchinson, Donald O.; and Frey, Frederick W., Jr., 3,860,416.
Hutchinson, Francis Gowland: *See—*
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Huth, Heinz; and Werner, Klaus, to Dragoco Gerberding & Co. GmbH. Essences of fresh pot-herbs and process for preparing same. 3,860,734, Cl. 426-369.000.
Hyde, Thomas A. Winged device. 3,860,203, Cl. 244-138.00A.
Hydranautics: *See—*
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I.W.S. Nominee Company Limited: *See—*
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Ibuka, Yasuhiko; Ito, Shinya; and Nishikawa, Takehiko, to Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho. Lock means for the steering handle shaft of an automobile. 3,859,828, Cl. 70-252.000.
Ichikawa, Mikihiro: *See—*
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Ikeda, Osamu; and Kato, Motohiko, to Dauch Seiyaku Company, Limited. Method for curing stock symptoms. 3,860,706, Cl. 424-180.000.
Ikegaya, Masashi; and Shigeta, Fumio, both of, to Riken Light Metal Industries Co., Ltd. Method for forming a colored coating on aluminous materials. 3,860,503, Cl. 204-58.000.
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Imamura, Kennosuke; Kikuchi, Toshio; and Kanazawa, Shunichi, to Nippon Chemical Industrial Co., Ltd. Process for preparing 3-hydroxy-isoxazole derivative. 3,860,603, Cl. 260-307.00H.
Imanishi, Kaoru; and Inoue, Hisayoshi, to Matsushita Electric Industrial Co., Ltd. Magnetic tape duplicating apparatus. 3,860,957, Cl. 360-17.000.
Imperial Chemical Industries Limited: *See—*
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Inoue, Hisayoshi: *See—*
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Inoue, Kiyoshi; and Kaneko, Hideo, to Ishijuku Kinzoki Kogyo K.K. Method of making a magnetic body. 3,860,458, Cl. 148-120.000.
Institut Neorganicheskoi Khimii: *See—*
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Irvine, David; Barlow, Earl; Carnes, John K.; and Schmidt, William F., to Lit-Ning Products Co. Hanging file support structure. 3,860,119, Cl. 211-45.000.

Ishijuku Kinzoki Kogyo K.K.: *See—*
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Ishikawa, Hidehiko: *See—*
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Ishikawa Manufacturing Co.: *See—*
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Ishikawa, Soji, to Ishikawa Manufacturing Co. Filter and needle assembly incorporating the filter. 3,859,999, Cl. 128-218.00N.

Ishizumi, Kikuo; Mori, Kazuo; Okamoto, Tadashi; Akase, Takeshi; Izumi, Takahiro; Akatsu, Mitsuhiro; Kume, Yoshiharu; Inaba, Shigeho; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Purification of benzodiazepine derivatives. 3,860,575, Cl. 260-239.0BD.

Isquith, Alan J.: *See—*
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Ito, Akihiko: *See—*
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Ito, Shinya: *See—*
Ibuka, Yasuhiko; Ito, Shinya; and Nishikawa, Takehiko, 3,859,828.

Itoh, Tohru: *See—*
Kubo, Shuji; and Itoh, Tohru, 3,860,956.

ITT Industries, Inc.: *See—*
Sauer, Wolfgang, 3,859,781.

Izumi, Takahiro: *See—*
Ishizumi, Kikuo; Mori, Kazuo; Okamoto, Tadashi; Akase, Takeshi; Izumi, Takahiro; Akatsu, Mitsuhiro; Kume, Yoshiharu; Inaba, Shigeho; and Yamamoto, Hisao, 3,860,575.

J. C. Soding & Halbach: *See—*
Bechem, Karl Gunther, 3,860,292.

Jaatinen, Per Arno: *See—*
Kerttula, Into; and Jaatinen, Per Arno, 3,860,368.

Jackson, Charles A.: *See—*
Horton, Lawrence R.; Jackson, Charles A.; Holcomb, William P.; and Horton, Catherine, 3,860,269.

Jackson, Earl V.; Schoppe, Wayne F.; Squassoni, Gino F.; and Warter, Peter J., to Xerox Corporation. Photoelectrophoretic imaging machine and apparatus for contacting a roller to a surface to be contacted. 3,860,336, Cl. 355-3.00P.

Jackson, William E.; and Becker, James M. Retractable tag-axle assembly for overland vehicles. 3,860,256, Cl. 280-81.00R.

Jaco, Charles M., Jr., to Dravo Corporation. Landfill disposal of power plant wastes. 3,859,799, Cl. 61-35.000.

Jacobs, Leslie Floyd, to International Telephone and Telegraph Corporation. Trim ring and method of producing same. 3,860,294, Cl. 301-37.00R.

Jaeger, Horst, to Ciba-Geigy Corporation. Perfluoralkylmonocarboxylic acid esters. 3,860,613, Cl. 260-340.700.

Jager, Hans-Joachim, to Seewer, Gustave Auguste. Auxiliary apparatus for cutting and punching out bands of dough mountable at a dough rolling machine having driven dough rollers. 3,860,374, Cl. 425-161.000.

Jahabow of Utah, Inc.: *See—*
Aspenwall, John E., 3,859,767.

Jahn, Apul F.: *See—*
Lachman, Walter L.; Penty, Robert A.; and Jahn, Apul F., 3,860,443.

Jaisle, Richard Frederick; Albrinck, Donald Joseph; and Grosheim, Gene Edward, to Formica Corporation. Process for making master textured copies for use in making textured laminates. 3,860,470, Cl. 156-85.000.

Jaklitsch, Richard F.: *See—*
Leto, Anthony; Jaklitsch, Richard F.; and Ackerman, Edward R., 3,859,785.

James, Frazier N., Sr.; and Walker, Thomas E., to Walutes, Ronald L.; and Cohen, Bernard S., Co-Trustees in Bankruptcy of Frazier N. James, Sr., by said Walker. Document transporter. 3,860,118, Cl. 209-73.000.

James Ross Limited: *See—*
Brown, Jack Frederick, 3,859,690.

Jankowski, Alfred S.: *See—*
Duffek, Edward F.; Funk, Ernest J.; Jankowski, Alfred S.; Lane, Jack C.; Lehner, William L.; Oliver, Floyd F.; and Schneider, Mark, 3,859,715.

Janney, Gary M.; and Senf, Henry R., to Hughes Aircraft Company. Transmit-receive subsystem for laser radars. 3,860,343, Cl. 356-28.000.

Jansson, Lennart Ingemar, to Kommanditbolaget United Stirling (Sweden) AB & Co. Method for regulating the power output of a hot gas engine. 3,859,793, Cl. 60-521.000.

January, John Kenneth; and Marchant, Alan, to Imperial Chemical Industries Limited. Alkyl benzene isomerisation process. 3,860,668, Cl. 260-668.00A.

Japan Atomic Energy Research Institute: *See—*
Yoshida, Masaru; Nakase, Yoshiaki; and Ito, Akihiko, 3,860,562.

Japan Exlan Company Limited: *See—*
Nakagawa, Kazumi; Kuratani, Keijiro; Minami, Shinsaku; and Keiichi, Zoda, 3,860,685.

Jayawant, Madhusudan D., to du Pont de Nemours, E. I., and Company. Process for the preparation of perhydrates. 3,860,694, Cl. 423-307.000.

Jefferson Chemical Company, Inc.: *See—*
Bentley, Floyd Edward, 3,860,637.

Jenkins, William Melchior: *See—*
Hunt, Ronald Eugene; and Jenkins, William Melchior, 3,860,248.

Jermyn, Thomas: *See—*
Rattcliff, Graham; and Kemp, Ronald Sidney Thomas, 3,860,313.

Jerrold Electronics Corporation: *See—*
Everhart, Norman; Herman, James; and Meise, William, 3,860,748.

Jeru, Henri Jean-Marie: *See—*
Bieth, Andre Jean; Jeru, Henri Jean-Marie; and Bakker, Bernard Roger Pierre, 3,860,129.

Jeuken, Josef; Vieregge, Gustav; and Massberg, Wolfgang, to Rheinstahl AG. Ring rolling mill. 3,859,830, Cl. 72-10.000.

Jilbert, Richard Robert, to Illinois Tool Works Inc. Inserted blade cutter. 3,859,700, Cl. 29-96.000.

Jindai, Akio: *See—*
Shimizu, Masami; and Jindai, Akio, 3,859,876.

Jochimski, Stefan. Filter apparatus with movement means. 3,860,404, Cl. 55-385.000.

Joeckel, Stanley V. Plier type tool. 3,859,874, Cl. 81-367.000.

Johansson, Folke Kark Evald: *See—*
Josefsson, Erik Anders Ake; Johansson, Folke Kark Evald; Almqvist, Kurt Karl Axel; and Von Hoftsten, Carl Fredrik, 3,860,418.

Johansson, Matti: *See—*
Vourinen, Jouko; Ingman, Yrjo; Johansson, Matti; and Kurkinen, Martti, 3,860,457.

John Thomas Batts, Inc.: *See—*
Batts, John H.; and Garrison, Judd F., 3,859,710.

Johnsen, Ole H.: *See—*
Hatten, Jostein; and Johnsen, Ole H., 3,860,053.

Johnson, Bertrand Harold, to Bell Telephone Laboratories, Incorporated. Led display. 3,860,424, Cl. 96-38.400.

Johnson, Craig E.; and Henderson, Larry D., to United States of America, Navy. Method of bonding using nitrocellulose containing adhesive compositions. 3,860,477, Cl. 156-331.000.

Johnson Gage Company, The: *See—*
Johnson, Stanley G., 3,859,730.

Johnson, James R., to Minnesota Mining and Manufacturing Company. Dual cross-flow catalyst system. 3,860,535, Cl. 252-472.000.

Johnson & Johnson: *See—*
Goff, Richard E., Jr.; Priestley, Joseph A.; and Staffier, Thomas L., 3,860,046.
Thomas, Joseph John; and Smith, William, 3,859,998.
Worcester, Ben C., Jr.; and Watson, Doma A., 3,860,045.

Johnson, Norman Allen. Log skidder grapple. 3,860,282, Cl. 294-112.000.

Johnson, Paul Richard; Teymourian, Jamshid; Rothrock, Elmer Weyman; Kircik, Willis James; and Lange, Kenneth Wilson, to Chicago Bridge and Iron Company. Flat bottom ship tank for transport of liquefied gas. 3,859,805, Cl. 62-45.000.

Johnson, Peter Alan, to George Kent Limited. Circuits for detecting rapid fluctuations in the phase of an a.c. signal. 3,860,867, Cl. 324-83.00R.

Johnson, Ralph S. Method and apparatus for dispensing granular material from aircraft. 3,860,202, Cl. 244-136.000.

Johnson, Richard T., to Sam Stein Associates, Inc. Breading machine conveyor. 3,860,105, Cl. 198-122.000.

Johnson, Robert H.: *See—*
Boucher, C. Wendell; and Hanneman, Thomas W., 3,860,767.

Johnson, Roger E.; and Sawai, Joe Y., to Ford Motor Company. Trim separation. 3,860,125, Cl. 214-1.0BH.

Johnson, Roger L.; Ebeling, Frederick A.; and Parry, James H., to University of Illinois Foundation. Light beam position encoder apparatus. 3,860,754, Cl. 178-18.000.

Johnson, Stanley G., to Johnson Gage Company, The. Screw thread gage using drag for testing. 3,859,730, Cl. 33-199.00R.

Johnson, William R., to United States Steel Corporation. Electrodeposition of tin. 3,860,502, Cl. 204-54.00R.

Johnson, William S.: *See—*
De Witt, David; and Johnson, William S., 3,860,454.

Jones, Alan Richardson, to Coulter Electronics, Inc. Cuvette construction. 3,860,347, Cl. 356-246.000.

Jones, Howard: *See—*
Shen, Tsung-Ying; and Jones, Howard, 3,860,636.

Jones, John L.: *See—*
Rubino, Andrew M.; Gilman, William S.; and Jones, John L., 3,860,705.

Jones, William J., to Westinghouse Electric Corporation. Method of measuring O_2 and O_2 containing constituents. 3,860,498, Cl. 204-1.00T.

Jordan, William E., to Xerox Corporation. Optical alignment on vacuum plenum. 3,860,340, Cl. 355-16.000.

Josefsson, Erik Anders Ake; Johansson, Folke Kark Evald; Almqvist, Kurt Karl Axel; and Von Hoftsten, Carl Fredrik, to Stora Kopparbergs Bergslags Aktiebolag. Method of refining iron melts containing chromium. 3,860,418, Cl. 75-60.000.

Jos. Hunkeler AG Fabrik fur graphische Maschinen: *See—*
Luscher, Paul, 3,859,958.

Joslin, Robert E.: *See—*
Lafond, Maurice; and Joslin, Robert E., 3,859,694.

Jullien-Davin, Jean, to Crouzet. Arrester device for small self-starting synchronous motors. 3,860,841, Cl. 310-41.000.

Jurges, Charles D., to Intalco Aluminum Corporation. Self-sealing pressurized container loading hatch. 3,860,142, Cl. 220-344.000.

Kabushiki Kaisha Maekawa Seisakusho: *See—*
Kasahara, Keisuke, 3,859,815.

Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho: *See—*
Ibuka, Yasuhiko; Ito, Shinya; and Nishikawa, Takehiko, 3,859,828.

Kabushiki Kaisha Tokyo Keikio (Tokyo Keiki Co., Ltd.): *See—*
Asada, Hidekazu; and Tamura, Kohzoh, 3,859,846.

Kabushiki Kaisha Toyota Chun Kenkyusho: *See—*
Yamanaka, Teruo; Kato, Takayuki; Ozeki, Osamu; Sato, Kazuo; and Bito, Minoru, 3,860,923.

Kabushikikaisha Tokyo Keiki: *See—*
Ota, Hiroshi; and Mizutani, Kazumi, 3,860,927.
Terakawa, Takashige; and Hidaka, Sadahiko, 3,860,933.

Kahle Engineering Co.: *See—*
Mastik, Emil A., 3,860,408.

Kaiser, Ado; Koch, Wolfgang; Scheer, Marcel; and Wolcke, Uwe, to Hoffmann-La Roche Inc. Phenethylamide derivatives. 3,860,630, Cl. 260-471.00C.

Kaiser Aluminum & Chemical Corporation: *See—*
Beadle, Burton J.; and Ray, Jack C., 3,860,688.

Kaiser, Carl: *See—*
Colella, Donald F.; and Kaiser, Carl, 3,860,647.

Kali-Chemie Fluor GmbH: *See—*
Kaudewitz, Peter; and Friedrich, Hubert, 3,860,504.

Kalninsh, Arvid Yanovich: *See—*
Putnin, Aina Yanovna; Shvarts, Evgenia Mikhailovna; Ermush, Nina Avgustovna; Ievinsh, Alfred Fritsevich; and Kalninsh, Arvid Yanovich, 3,860,626.

Kameyama, Tadao: *See—*
Mitsui, Nobuo; Kameyama, Tadao; Watanabe, Akinori; Fukushima, Isao; and Hatakeyama, Takanobu, 3,860,093.

Kanazawa, Shunichi: *See—*
Imamura, Kennosuke; Kikuchi, Toshio; and Kanazawa, Shunichi, 3,860,603.

Kaneko, Hideo: *See—*
Inoue, Kiyoshi; and Kaneko, Hideo, 3,860,458.

Kano, Ichiro, to Canon Kabushiki Kaisha. High resolving power copying lens of unity magnification. 3,860,327, Cl. 350-214.000.

Kaplan, Abner; and Dean, William J., to United States of America, Army. Two piece ammunition round. 3,859,922, Cl. 102-93.000.

Kaplan, Marx, to Raymond Lee Organization, Inc., The, a part interest. Refrigerant containing sandwich storage device. 3,859,819, Cl. 62-371.000.

Kapp, Edward J.: *See—*
Brymer, Barbara J.; Kapp, Edward J.; and Keister, Frank Z., 3,860,835.

Karger, Mikhail Iosifovich; Tolochko, Leonid Vasilievich; and Yaroschuk, Petr Vladimirovich. Rotary-type control switch for selectively controlling a plurality of electrical circuits. 3,860,774, Cl. 200-155.00R.

Karls, Robert F.; and Enright, James H., to Emerson Electric Co. Compactor. 3,859,908, Cl. 100-53.000.

Karls, Robert F.; and Enright, James H., to Emerson Electric Co. Compactor. 3,859,911, Cl. 100-215.000.

Karlsson, Signar, to Allmanna Svenska Elektriska Aktiebolaget. Grab means for a number of load units. 3,860,280, Cl. 294-87.00R.

Karsnak, George D., to U.S. Baird Corporation, The. Toggle actuated horizontal press. 3,859,838, Cl. 72-451.000.

Kasahara, Keisuke, to Kabushiki Kaisha Maekawa Seisakusho. Two-stage compression apparatus. 3,859,815, Cl. 62-197.000.

Kasuga, Akira: *See—*
Akashi, Goro; Fujiyama, Masaaki; and Kasuga, Akira, 3,860,449.

Katainen, Lauri Antero. Sailing gear for water craft. 3,859,943, Cl. 114-39.000.

Katayama, Hajime; Tsukada, Syusei; Kitajima, Talayuki; and Kuge, Tsukasa, to Canon Kabushiki Kaisha. Cleaning apparatus for electrophotography. 3,859,691, Cl. 15-256.510.

Katchka, Jay R., to Robertshaw Controls Company. Combination thermostat and regulator valve device. 3,860,170, Cl. 236-92.00A.

Kato, Mikio. Bathtub or the like drain control and overflow regulator. 3,859,676, Cl. 4-206.000.

Kato, Motohiko: *See—*
Ikeda, Osamu; and Kato, Motohiko, 3,860,706.

Kato, Takayuki: *See—*
Yamanaka, Teruo; Kato, Takayuki; Ozeki, Osamu; Sato, Kazuo; and Bito, Minoru, 3,860,923.

Katsimbas, Themistoklis; Dalibor, Horst; Kiessling, Hans-Joachim; and Schmidt, Rolf, to Reichhold-Albert-Chemie Aktiengesellschaft. Heat hardenable film-forming copolymers which are soluble in organic solvents. 3,860,563, Cl. 260-72.00R.

Katterjohn, Herman E., Jr. Dryer preheater. 3,859,735, Cl. 34-86.000.

Kaudewitz, Peter; and Friedrich, Hubert, to Kali-Chemie Fluor GmbH. Process for the production of elemental fluorine by electrolysis. 3,860,504, Cl. 204-59.00R.

Kaufman, Harold B.; Roth, Howard; and McCarthy, John P., to DCA Food Industries Inc. Combination apparatus including extruder and supply for making annular bodies with an annular filling. 3,860,373, Cl. 425-155.000.

Kawachi, Youji: *See—*
Ono, Minoru; Momoi, Toshimitsu; and Kawachi, Youji, 3,860,948.

Kawakami, Akira: *See—*
Gamo, Hiroshi; and Kawakami, Akira, 3,860,947.

Kawano, Haruyoshi: *See—*
Namiki, Ryoichi; and Kawano, Haruyoshi, 3,860,857.

Kawasaki, Itaru; Kobayashi, Kazutsugu; and Igarashi, Yoshiaki, to Matsushita Electric Industrial Co., Ltd. Rotating electric machine with reduced cogging. 3,860,843, Cl. 310-67.000.

Kawasaki, Iwawo: *See—*
Okabe, Masanaga; Nakamura, Hiroshi; Sakata, Sumio; Kawasaki, Iwawo; and Morikawa, Yasuo, 3,860,434.

Kawase, Susumu: *See—*
Orii, Masayoshi; Saito, Takayuki; Saito, Ryuji; Kawase, Susumu; Mashizu, Isutomu; and Watanabe, Masayoshi, 3,860,747.

Kay Laboratories, Inc.: *See—*
Keele, Susan Steves; and Watson, William Keith Ross, 3,859,856.

Kazaoka, Kenichi; Hirose, Kimiharu; Takeshita, Yasuo; and Matsumoto, Hisao, to Aisin Seiki Kabushiki Kaisha. Safety belt for vehicles. 3,860,260, Cl. 280-150.0SB.

Kearney-National, Inc.: *See—*
Ball, Robert D., 3,860,321.

Keele, Susan Steves; and Watson, William Keith Ross, to Kay Laboratories, Inc. Apparatus and method for measuring a temperature. 3,859,856, Cl. 73-356.000.

Keene Corporation: *See—*
Fabbri, William C., 3,860,829.

Kehse, Wolfgang; and Weber, Klaus, to Extraktionslechnik Gesellschaft fur Anlagenbau mbH. Rotary extractor. 3,860,395, Cl. 23-269.000.

Keiichi, Zoda: *See—*
Nakagawa, Kazumi; Kuratani, Keijiro; Minami, Shinsaku; and Keiichi, Zoda, 3,860,685.

Keim, Kenneth John; and Landman, Dirk, to du Pont de Nemours, E. I., and Company. Crimping apparatus. 3,859,708, Cl. 29-203.0DT.

Keister, Frank Z.: *See—*
Brymer, Barbara J.; Kapp, Edward J.; and Keister, Frank Z., 3,860,835.

Keller, Herbert: *See—*
Bernander, Karl-Gustav; and Keller, Herbert, 3,860,687.

Kemp, James A. Cushion heel pad for spur heels. 3,859,740, Cl. 36-71.000.

Kemp, Ronald Sidney Thomas: *See—*
Rattcliff, Graham; and Kemp, Ronald Sidney Thomas, 3,860,313.

Kemper, Jurgen, to Siemens Aktiengesellschaft. Circuit arrangement for the measuring of the maximal value of the distortion of a binary series of steps during an adjustable measuring period. 3,860,798, Cl. 235-92.0PB.

Kendall Company, The: *See—*
Binard, William J.; and Dye, John F., 3,860,007.
Dye, John F.; Binard, William J.; and Anglada, Leonard R., 3,859,854.
Patel, Bhupendra C., 3,860,006.

Kenics Corporation: *See—*
Grout, Kenneth M., 3,860,217.

Kenyon, Andre J., to Schaefer Corporation. Refrigerated cabinet canopy. 3,860,306, Cl. 312-116.000.

Kersch, Leonard A.; and Champagne, Edwin B., to GCO, Inc. Method of compensating for gross object motion in real time holographic interferometry. 3,860,346, Cl. 356-109.000.

Kerttula, Into; and Jaatinen, Per Arno. Continuous action board press. 3,860,368, Cl. 425-3.000.

Kerwood, Joseph Edward: *See—*
Coran, Aubert Yaucher; and Kerwood, Joseph Edward, 3,860,605.

Keskkula, Henno: *See—*
Narayana, Munisamappa; Keskkula, Henno; Mason, Jerry E.; and Dow Chemical Company, The, 3,860,551.

Kessler, Erich: *See—*
Kowallik, Joachim; and Kessler, Erich, 3,860,671.

Ketting, Gabor T.: *See—*
Cavicchi, Allen W.; and Ketting, Gabor T., 3,860,358.

Keyes, Melvin H.; and Semersky, Frank E., to Owens-Illinois, Inc. Insolubilizing enzymes with polystyrene derivatives. 3,860,486, Cl. 195-68.000.

Khoobiar, Sargis: *See—*
Becker, Mitchell; and Khoobiar, Sargis, 3,860,650.

Khuzaje, Kamel A., to General Electric Company. Pressure tap connection. 3,859,853, Cl. 73-213.000.

Kick, Charles L., to Raymond Lee Organization, Inc., The, a part interest. Auxiliary cooling system for engine of air conditioned motor vehicle. 3,859,817, Cl. 62-244.000.

Kienzle Apparate GmbH: *See—*
Fichter, Manfred; Spauszus, Siegfried; and Warkentin, Ulrich, 3,860,806.
Fichter, Manfred; Spauszus, Siegfried; and Warkentin, Ulrich, 3,860,807.

Kiessling, Hans-Joachim: *See—*
Katsimbas, Themistoklis; Dalibor, Horst; Kiessling, Hans-Joachim; and Schmidt, Rolf, 3,860,563.

Kihnke, Lee S., to Dake corporation. Product packaging apparatus. 3,859,775, Cl. 53-189.000.

Kikuchi, Toshio: *See—*
Imamura, Kennosuke; Kikuchi, Toshio; and Kanazawa, Shunichi, 3,860,603.

Kilbourn, Edward E.; Weir, William D.; and Carley, Harold E., to Rohm and Haas Company. Derivatives of 4-(2-aminophenyl)-3-thioallophanic acid. 3,860,586, Cl. 260-240.00G.

Killgus, Theo: *See—*
Fischer, Artur; Porlein, Gerhard; and Killgus, Theo, 3,860,323.

Kim, Dong H.; and Santilli, Arthur A., to American Home Products Corporation. 2-Aryl-4-substituted-amino-5-pyrimidyl derivatives. 3,860,596, Cl. 260-256.40N.

Kimbell, Wayne L.; and Edlund, Richard P. Novel portable amplifier and speaker. 3,860,755, Cl. 179-1.00E.

Kimberly-Clark Corporation: *See—*
Evans, Ernest C.; and Gurnee, Clarence E., 3,859,841.
Selke, William A., 3,860,012.

King, Hewson Nicholas Graham: *See—*
Schagen, Pieter; King, Hewson Nicholas Graham; and Washington, Derek, 3,860,849.

King, John: *See—*
Cairns, Hugh; Hunter, Dennis; and King, John, 3,860,617.

King, Milton H., Jr. Tray cart washer. 3,860,020, Cl. 134-111.000.

King, Orville D.; and Rosales, Joseph G. Combustion gas treatment. 3,859,788, Cl. 60-280.000.

Kinnear, Joseph D.: *See—*
Danner, Robert, 3,860,320.

Kinsky, Siegfried; Segaert, Jan; Matuschek, Max; and Koeppe, Wolfgang, to Siemens Aktiengesellschaft. Method of dip-soldering printed circuits to attach components. 3,859,722, Cl. 29-626.000.

Kinslow, William G., Jr.; Marchant, Paul A.; Bessier, Robert D.; and Hafele, Robert X., to Ethyl Development Corporation. Blow molding apparatus. 3,860,375, Cl. 425-182.000.

Kipp, Frederick M., to General Electric Company. Electric oven toaster toast server mechanism. 3,859,903, Cl. 99-391.000.

Kircik, Willis James: *See—*
Johnson, Paul Richard; Teymourian, Jamshid; Rothrock, Elmer Weyman; Kircik, Willis James; and Lange, Kenneth Wilson, 3,859,805.

Kirk, Malcolm: *See—*
Roe, Malcolm David; Donald, John Henry; Chappell, Peter Lee; Kirk, Malcolm; Edwards, John David; and Greenham, Stanley Keith, 3,860,793.

Kirkby, Rodney John: *See—*
Pope, Donald Geoffrey; and Kirkby, Rodney John, 3,860,931.

Kissinger, Ralph, Jr., to Erickson, Lennart G., a part interest. Sanitary flushable floor for cattle confinement feedlots. 3,859,962, Cl. 119-28.000.

Kitai, Kiyoshi, to Seiko Koki Kabushiki Kaisha. Clock with illumination device. 3,859,782, Cl. 58-50.00R.

Kitajima, Talayuki: *See—*
Katayama, Hajime; Tsukada, Syusei; Kitajima, Talayuki; and Kuge, Tsukasa, 3,859,691.

Kitchens, Garry C., to Givaudan Corporation. Substituted norbornyl and nortricyclyl derivatives and their use in perfumery. 3,860,635, Cl. 260-488.00B.

Klaiber, Gerhart F.; Villadsen, Ove; and Schwartz, Charles, to TIE/-Communications, Inc. Toll restriction circuit. 3,860,762, Cl. 179-18.0DA.

Klang, Daniel M.; and Mosciatti, Roger. Light collecting and transmitting apparatus. 3,860,814, Cl. 250-227.000.

Klaviter, Walter F.: *See—*
Borowski, Norbert F.; Marek, Donald C.; Panek, Bruno J.; and Klaviter, Walter F., 3,860,131.

Klein, Paul R.: *See—*
Luitwieler, Samuel H., Jr.; and Klein, Paul R., 3,860,823.

Klemchuk, Peter, to Ciba-Geigy Corporation. Stabilized polyamide compositions. 3,860,558, Cl. 260-45.80N.

Kling, Alfred; Specht, Viktor; Hofstetter, Carmen; and Eisenberg, Gundolf, to Benckiser-Knapsack GmbH. Bleaching of cellulose containing textile fiber material with a silicate-free stabilized peroxide bleaching bath. 3,860,391, Cl. 8-111.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Deussner, Herbert, 3,860,303.

Kloth, James Albert; Parsons, Stuart L.; Zimmerman, John Aaron, Jr.; and Vigeant, George Henry, deceased (by Vigeant, Mrs. George Henry, executrix), to AMP Incorporated. Method and apparatus for a wiring system utilizing wiring devices. 3,860,739, Cl. 174-48.000.

Klygis, Mindaugas Julius, to Illinois Tool Works Inc. Bottle carrier. 3,860,112, Cl. 206-151.000.

KM Insinooritoimisto Oy-KM Ingenjorsbyra Ab: *See—*
Sulkiewicz, Jan, 3,859,682.

Knepper, William A.: *See—*
Cohlmeyer, Stanley H.; Harrell, Wade H.; and Knepper, William A., 3,860,376.

Knockeart, Ronald P.; and Wilkinson, John R., to Bendix Corporation, The. System for converting modulated signals to squarewave outputs. 3,860,794, Cl. 235-61.11E.

Knof, Hans, Dr.: *See—*
Knof, Hans Kurt; Krafft, Hermann Dietrich; and Hausen, Volker Wilhelm, 3,860,848.

Knof, Hans Kurt; Krafft, Hermann Dietrich; and Hausen, Volker Wilhelm, to Knof, Hans, Dr. High pressure ion source for ion optical analytical equipment and for particle accelerators. 3,860,848, Cl. 313-231.000.

Knorr-Bremse GmbH: *See—*
Erath, Wolfgang, 3,860,298.

Knothe, Erich Emil Karl; and Melcher, Franz-Josef, to Sartorius-Werke GmbH. Method and apparatus for ascertaining a steady state value of a continuously variable measured quantity. 3,860,802, Cl. 235-151.330.

Kobalter, Gerald F., to Aerojet General Corporation. Flexible nozzle for a thrust vector control system. 3,860,134, Cl. 239-265.430.

Kobayashi, Kazutsugu: *See—*
Kawasaki, Itaru; Kobayashi, Kazutsugu; and Igarashi, Yoshiaki, 3,860,843.

Koch, John P. Volleyball net antenna clamp. 3,860,240, Cl. 273-95.00R.

Koch, Wolfgang: *See—*
Kaiser, Ado; Koch, Wolfgang; Scheer, Marcel; and Wolcke, Uwe, 3,860,630.

Kodaira, Nobuhisa. Apparatus for heat treatment of synthetic fibrous yarn. 3,860,386, Cl. 432-59.000.

Koehler, Albert M.; Crout, Jesse W.; and Shaw, Larry K., to Brown & Root, Inc. Method and apparatus for transporting and launching an offshore tower. 3,859,804, Cl. 61-46.500.

Koepke, John Albert, to Illinois Tool Works Inc. Electrical switch having movable spring contacts which provide wiping action with associated stationary contacts. 3,860,775, Cl. 200-164.00R.

Koeppe, Wolfgang: *See—*
Kinsky, Siegfried; Segaert, Jan; Matuschek, Max; and Koeppe, Wolfgang, 3,859,722.

Kojima, Shizuka, to Tomy Kogyo Co., Ltd. Continuous racetrack having turnaround portions. 3,860,238, Cl. 273-86.00C.

Kolbach, Charles G., to Scott Paper Company. Absorbent articles. 3,860,002, Cl. 128-284.000.

Kolerus, Josef; and Peterschinegg, Hans, to Zimmer, Peter. Method and device for the production of printing stencils. 3,860,749, Cl. 178-6.60B.

Kollar, John, to Halcon International, Inc. Process for treating the product mixture from the epoxidation of olefinic hydrocarbons. 3,860,662, Cl. 260-618.00C.

Komiya, Yoshio: *See—*
Tarui, Yasuo; Komiya, Yoshio; and Sakamoto, Tsunenori, 3,860,916.

Kommanditbolaget United Stirling (Sweden) AB & Co.: *See—*
Hakansson, Sven Anders Samuel, 3,859,794.
Jansson, Lennart Ingemar, 3,859,793.

Konaka, Isao: *See—*
Kubota, Ikuo; Mikami, Masakatsu; Konaka, Isao; and Misaki, Toshihiko, 3,860,699.

Konantz, Mark L.; and Leisure, Ronald K., to General Motors Corporation. Method of applying silicone passivants to etch moats in mesa device wafers. 3,860,448, Cl. 117-212.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Matsuo, Shunji; Sato, Shui; Ishikawa, Hidehiko; Nakamura, Shinichi; and Taguchi, Masahiko, 3,860,427.

Koot, Antonius Cornelis, to Industrie Koot B.V. Industrieterrein "De Hooge Waard". Device for recording the speed and/or the covered distance of a vehicle. 3,859,860, Cl. 74-12.000.

Koppers Company, Inc.: *See—*
Covelli, Fred M., 3,860,599.

Korn, Gerhard; and Piepenbreier, Ernst, to Rheinstahl AG. Resilient double axle railway car drive. 3,859,929, Cl. 105-131.000.

Korovyanko, Alexandr Dmitrievich: *See—*
Krylov, Alexandr Iosifovich; Myshko, Vladimir Semenovich; Smirnov, Leonid Stepanovich; Maslennikov, Jury Ivanovich; Vikulov, Igor Makarovich; Gontarenko, Alexandr Nikolaevich; Korovyanko, Alexandr Dmitrievich; and Zaitsev, Valery Pavlovich, 3,859,824.

Korpel, Adrianus: *See—*
Adler, Robert; and Korpel, Adrianus, 3,860,752.

Kosarko, Gerald Julius: *See—*
Holzhauser, Ronald Charles; and Kosarko, Gerald Julius, 3,860,195.

Kosowsky, Lester H.: *See—*
Cheo, Bernard Ru-Shao; Kosowsky, Lester H.; Smith, Peter W.; and Soong, An-Hwa, 3,860,934.

Kottle, Sherman: *See—*
Vaughn, Walter L.; Kottle, Sherman; and Symm, Richard H., 3,860,441.

Kowallik, Joachim; and Kessler, Erich, to Akzona Incorporated. Polyamide fibers with improved antistatic effect and their preparation. 3,860,671, Cl. 260-858.000.

Kozeki, Moribumi, to Mitsui Shipbuilding & Engineering Co., Ltd. Once through boiler. 3,859,964, Cl. 122-32.000.

Kozu, Isao; and Kurihara, Hidetoshi, to Matsushita Electric Industrial Co., Ltd. Tape cartridge changer. 3,860,964, Cl. 360-92.000.

Krackeler, Joseph J.; and DeClerck, Michael C., to National Distillers and Chemical Corporation. Flame retardant compositions. 3,860,676, Cl. 260-897.00B.

Krafft, Hermann Dietrich: *See—*
Knof, Hans Kurt; Krafft, Hermann Dietrich; and Hausen, Volker Wilhelm, 3,860,848.

Kraftco Corporation: *See—*
Roberts, Miron J.; and Runge, Heinz F., 3,859,905.

Krah, Robert: *See—*
Budich, Wolfgang; Krah, Robert; and Theissen, Hans, 3,859,754.

Krajewski, John J.: *See—*
Lang, William J.; and Krajewski, John J., 3,860,414.

Krall, Heribert A.; and Maag, Helmut, to Technica-Guss GmbH. Loose band coiler for use with horizontal continuous casting machine. 3,859,829, Cl. 72-9.000.

Kramer, L. Jonathan: *See—*
Maltby, Frederick L.; and Kramer, L. Jonathan, 3,860,882.

Kramer, Mark Maximovich: *See—*
Gavar, Valdis Valdovich; Dindun, Alexandr Stanislavovich; Kramer, Mark Maximovich; Platatsis, Ernest Yanovich; Mikelson, Artur Eduardovich; and Tomson, Elmar Yanovich, 3,860,825.

Kreider, Robert W., to DeSoto, Inc. High opacity resin coatings of emulsion polymers. 3,860,544, Cl. 260-29.60T.

Krenzer, John, to Velsicol Chemical Corporation. Thiadiazole substituted triazines. 3,860,593, Cl. 260-248.0NS.

Krenzer, John; and Richter, Sidney B., to Velsicol Chemical Corporation. Composition of matter. 3,860,644, Cl. 260-545.00R.

Krenzer, John: *See—*
Richter, Sidney B.; and Krenzer, John, 3,860,643.

Krespan, Carl G., to du Pont de Nemours, E. I., and Company. Macrocyclic polyether polyols and condensation polymers derived therefrom. 3,860,611, Cl. 260-338.000.

Krieger, David. Textured embroidered fabric. 3,859,941, Cl. 112-266.000.

Kritchevsky, Theodore H.: *See—*
Landwerlen, Richard G.; and Kritchevsky, Theodore H., 3,860,536.

Krumbein, Fritz, to Robert Bosch Photokino G.m.b.H. Apparatus for intercepting and advancing the leader of convoluted strip material. 3,860,196, Cl. 242-195.000.

Krylov, Alexandr Iosifovich; Myshko, Vladimir Semenovich; Smirnov, Leonid Stepanovich; Maslennikov, Jury Ivanovich; Vikulov, Igor Makarovich; Gontarenko, Alexandr Nikolaevich; Korovyanko, Alexandr Dmitrievich; and Zaitsev, Valery Pavlovich. Circular knitting machine for making weft knitted fabrics including warp yarns and weft yarns interconnected by ground loops. 3,859,824, Cl. 66-10.000.

Kubo, Shuji; and Itoh, Tohru, to Matsushita Electric Industrial Co., Ltd. Color target and method of manufacturing same. 3,860,956, Cl. 358-48.000.

Kubota, Ikuo; Mikami, Masakatsu; Konaka, Isao; and Misaki, Toshihiko, to Shinonaga Kasei Co., Ltd. Resin composition suitable for use in hair dressing preparations. 3,860,699, Cl. 424-47.000.

Kudou, Yoku. Magnetic recording and reproducing apparatus with heated tape guide. 3,860,959, Cl. 360-84.000.

Kuge, Tsukasa: *See—*
Katayama, Hajime; Tsukada, Syusei; Kitajima, Talayuki; and Kuge, Tsukasa, 3,859,691.

Kuhla, Donald E., to Pfizer Inc. IMIDAZO (2,1-b) THIAZOLE AND THIAZOLO (3,2-a) BENZIMIDAZOLE QUATERNARY SALTS HYPOGLYCEMIC AGENTS. 3,860,718, Cl. 424-270.000.

Kuhlman Corporation: *See—*
Dulude, Donald O.; and Winbigler, Paul H., 3,859,705.

Kukolja, Stjepan, to Eli Lilly and Company. Aminoazetidinoneacetic acid esters. 3,860,577, Cl. 260-239.00A.

Kume, Yoshiharu: *See—*
Ishizumi, Kikuo; Mori, Kazuo; Okamoto, Tadashi; Akase, Takeshi; Izumi, Takahiro; Akatsu, Mitsuhiro; Kume, Yoshiharu; Inaba, Shigeho; and Yamamoto, Hisao, 3,860,575.

Kumon, Osamu, to Sumitomi Electric Industries, Ltd. Piezoelectric buzzer assembly. 3,860,838, Cl. 310-8.500.

Kunz, Peter: *See—*
Utzinger, Diethelm; and Kunz, Peter, 3,860,077.

Kupersmith, Lertram F.: *See—*
Games, John E.; Casper, Clarence, Jr.; and Kupersmith, Lertram F., 3,860,877.

Kuramochi, Shigeaki. Pencil sharpener. 3,860,049, Cl. 144-28.720.

Kurashiki Rayon Co., Ltd.: *See—*
Nakajo, Shogo, 3,860,440.

Kuratani, Keijiro: *See—*
Nakagawa, Kazumi; Kuratani, Keijiro; Minami, Shinsaku; and Keiichi, Zoda, 3,860,685.

Kurath, Paul: *See—*
Thomas, Alford Mitchell; and Kurath, Paul, 3,860,570.

Kurihara, Hidetoshi: *See—*
Kozu, Isao; and Kurihara, Hidetoshi, 3,860,964.

Kurkinen, Martti: *See—*
Vourinen, Jouko; Ingman, Yrjo; Johansson, Matti; and Kurkinen, Martti, 3,860,457.

Kurtz, Bruce E.; and Bandyopadhyay, Bhaskar, to Allied Chemical Corporation. Production of chloride from ethylene dichloride. 3,860,595, Cl. 260-656.00R.

Kuszleyko, Ryszard, to Instytut Spawalnicta. Winding reconnection arrangement for a welding apparatus. 3,860,897, Cl. 336-147.000.

Kutnyak, Thomas A.; and Trelease, Robert, to Automation Industries, Inc. Duct. 3,860,043, Cl. 138-153.000.

Kuzia, Paul H.: *See—*
Wallace, John G.; and Kuzia, Paul H., 3,860,796.

Kuzmicheva, Nina Vasilievna: *See—*
Rabodzei, Nikolai Vasilievich; Astrin, Vladimir Alexandrovich; Kuzmicheva, Nina Vasilievna; Shidlovsky, Gennady Vladimirovich; Ljubimov, Evgeny Mikhailovich; and Nadobnikov, Mikhail Nikolaevich, 3,860,819.

Kymin Osakeyhtio-Kymmene Aktiebolag: *See—*
Vourinen, Jouko; Ingman, Yrjo; Johansson, Matti; and Kurkinen, Martti, 3,860,457.

Kyokuto Chosa - Sekkei Co. Ltd.: *See—*
Endo, Hidetomo, 3,859,731.

Labeda, Robert J. Skate wheel. 3,860,293, Cl. 301-5.700.

Labore, Walter T., to Pitney-Bowes, Inc. Envelope moistening device for a postage meter. 3,859,955, Cl. 118-32.000.

Lachman, Walter L.; Penty, Robert A.; and Jahn, Apul F., to Fiber Materials, Inc. Graphite composite. 3,860,443, Cl. 117-106.000.

Lachmann, Burkhard: *See—*
Rosenkranz, Hans Jurgen; Lachmann, Burkhard; and Rudolph, Hans, 3,860,598.

Lacrex Brevetti S.A.: *See—*
Pasbrig, Max, 3,859,869.

Laerdal, Asmund S. Device for use in teaching first aid. 3,859,737, Cl. 35-17.000.

Lafond, Maurice; and Joslin, Robert E., to Plessey Incorporated. Aerial cable clamp. 3,859,694, Cl. 24-271.000.

Lagally, Paul, to United States of America, Navy. Low density resin composite of high stiffness. 3,860,672, Cl. 260-859.000.

Lagermasini, Joseph P.: *See—*
Graham, Earl R.; Lagermasini, Joseph P.; Shaner, Kenneth H.; and Hopkins, David H., 3,860,499.

Lalonde, Alexandre Roger. Foldable table unit for an automobile. 3,859,931, Cl. 108-44.000.

Lambrecht, Robert E. Safety latch mechanisms. 3,860,276, Cl. 292-169.000.

Lamprecht, Adolf, to Rowenta-Werke GmbH. Apparatus for converting light energy into electrical energy. 3,860,863, Cl. 321-2.000.

Lamy, Jean-Marc: *See—*
Chretien, Gilbert; Girard, Philippe; Lamy, Jean-Marc; and Menard, Christophe, 3,860,555.

Landman, Dirk: *See—*
Keim, Kenneth John; and Landman, Dirk, 3,859,708.

Landwerlen, Richard G.; and Kritchevsky, Theodore H., to CPC International Inc. Enzyme-detergent combination. 3,860,536, Cl. 252-551.000.

Lane, Jack C.: *See—*
Duffek, Edward F.; Funk, Ernest J.; Jankowski, Alfred S.; Lane, Jack C.; Lehner, William L.; Oliver, Floyd F.; and Schneider, Mark, 3,859,715.

Lang, William J.; and Krajewski, John J., to International Minerals & Chemical Corporation. Use of graft copolymers as agglomeration binders. 3,860,414, Cl. 75-3.000.

Lange, Arthur A. Toy gun apparatus with baffle in bore thereof and projectile therefor configured to extend through the baffle. 3,859,977, Cl. 124-14.000.

Lange, Kenneth Wilson: *See—*
Johnson, Paul Richard; Teymourian, Jamshid; Rothrock, Elmer Weyman; Kircik, Willis James; and Lange, Kenneth Wilson, 3,859,805.

Langley, Lawrence W., to Corometrics Medical Systems, Inc. Ultrasonic transducer for fetal monitoring. 3,859,984, Cl. 128-2.05Z.

Lanier Electronic Laboratories, Inc.: *See—*
Bolick, Fred C., Jr., 3,860,190.

Large, George B., to Stauffer Chemical Company. Cyano substituted malanilate biocides. 3,860,627, Cl. 260-465.00D.

Laronze, Joseph, to Brown Boveri & Company Limited. Linear motor with multi-section armature and a drive device utilizing a linear motor of this kind. 3,860,840, Cl. 310-13.000.

Larsen, Abraham. Marker for use in fresh and sea water. 3,859,680, Cl. 9-9.000.

Larson, Paul U. Electrocardiogram mounting method. 3,860,474, Cl. 156-265.000.

Larson, Roger L., to Minnesota Mining and Manufacturing Company. Release fluid applicator. 3,859,957, Cl. 118-70.000.

Lascoux, Pierre, to Commissariat a L'Energie Atomique. Device for sampling gas within the rotating bowl of a centrifuge. 3,860,167, Cl. 233-22.000.

Laske, Louis Lawrence. Broom sleeve. 3,860,115, Cl. 206-361.000.

Latassa, Frank M.; Milke, Howard W.; and Sadoski, Tadius T., to GTE Sylvania Incorporated. Fluorescent lamp containing amalgam-forming material. 3,860,852, Cl. 313-490.000.

Lattion, Andre: *See—*
Schiltknecht, Adolf; and Lattion, Andre, 3,860,186.

Lau, Peter: *See—*
Finkelmeier, Hans-Joachim; Domke, Klaus; and Lau, Peter, 3,860,047.

Lawrence, Frederick R. Dressing aid. 3,860,156, Cl. 223-111.000.

Lawrence, John Brian, to du Pont de Nemours, E. I., and Company. Elastomeric compositions. 3,860,673, Cl. 260-859.00R.

Lawrence Peska Associates, Inc.: *See—*
Fish, Barry M., 3,860,246.

Lear Siegler Inc.: *See—*
Wootten, John A.; and Rives, George S., 3,860,000.

Learmont, Robert P., to United States Steel Corporation. Process for leaching mineral values from underground formations in situ. 3,860,289, Cl. 299-4.000.

Leask, George M.: *See—*
Vessio, Robert J.; Valeri, Frank E.; Leask, George M.; and Peterson, Richard W., 3,860,147.

Leatherman, Alfred F., to Heller, William C., Jr. Apparatus and process for printing. 3,859,913, Cl. 101-1.000.

Leblanc, George E., to Raymond Lee Organization, Inc., The. Toy dancing puppet. 3,859,751, Cl. 46-138.000.

LeBlanc, Larry M.: *See—*
Moran, Robert J.; Pateuk, Constantine J.; and LeBlanc, Larry M., 3,860,860.

Ledstrom, Richard L.; and Teeuwen, Lloyd M. Pipe coupling. 3,860,274, Cl. 285-312.000.

Lee, Kyu Tai. 2-(N-alkylcarbamoyloximido)-polymethyleneimines. 3,860,578, Cl. 260-239.0BF.

Lee, Thomas E.; and Frey, Frederick W., to Ethyl Corporation. Method of beneficiating alumina-silica ores. 3,860,514, Cl. 209-8.000.

Leeds & Northrup Company: *See—*
Fertik, Harry A., 3,860,407.

Leftin, David L. Board game apparatus. 3,860,241, Cl. 273-134.0AE.

Lehmann, Hans; Wehrli, Peter; and Schreiber, Bruno, to Ciba-Geigy Corporation. Storage-stable, rapidly curable epoxide resin composition. 3,860,541, Cl. 260-18.0PN.

Lehner, Francis E.: *See—*
Miller, Wayne F.; and Lehner, Francis E., 3,860,759.

Lehner, William L.: *See—*
Duffek, Edward F.; Funk, Ernest J.; Jankowski, Alfred S.; Lane, Jack C.; Lehner, William L.; Oliver, Floyd F.; and Schneider, Mark, 3,859,715.

Leisure, Ronald K.: *See—*
Konantz, Mark L.; and Leisure, Ronald K., 3,860,448.

Leiter, Leigh David, to Ametek, Inc. Self-erecting tube. 3,860,041, Cl. 138-144.000.

Lencioni, Cecil C., Jr., to Beckman Instruments, Inc. Open lead testing system for eeg. 3,859,988, Cl. 128-2.10B.

Leonard, Merrill G., to Westinghouse Electric Corporation. Circuit breaker for distribution transformer. 3,860,898, Cl. 337-59.000.

Leonardo, Onofrio; Giorgio, Giacomo; and Esposito, Francesco, to Richardson-Merrell S.p.A. Process for preparing hydroxy-l-proline or n-acetyl-hydroxy-l-proline from hydrolyzed gelatin. 3,860,607, Cl. 260-326.200.

Leontiev, Jury Nikolaevich: *See—*
Shkundin, Lev Romanovich; Braginsky, Roman Pavlovich; Finkel, Eduard Emmanuilovich; and Leontiev, Jury Nikolaevich, 3,860,159.

Leto, Anthony; Jaklitsch, Richard F.; and Ackerman, Edward R., to Curtiss-Wright Corporation. Turbine engine with integral compressor and alternator rotor. 3,859,785, Cl. 60-39.330.

Levin, Simon. Vaginal suction device. 3,860,001, Cl. 128-276.000.

Levine, Richard Carl, to Diecomp, Inc. Automatic method and apparatus for fabricating progressive dies. 3,860,803, Cl. 235-151.100.

Lewis Machine Company, a division of Wyle Laboratories: *See—*
Hawley, Sumner H.; and Feucht, Albert, 3,859,881.

Ley, Kurt: *See—*
Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,860,714.
Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,860,715.

Libby, Edward W.: *See—*
Douglas, Raymond J.; Libby, Edward W.; and Moquin, Leonard R., 3,860,264.

Lichtig, Sanford. Safety device for automobiles. 3,860,284, Cl. 296-75.000.

Lienemann, Darlo E.: *See—*
Bauman, Jack L.; and Lienemann, Darlo E., 3,860,146.

Liggett & Myers: *See—*
Norman, Vello, 3,860,011.

Lim, Mahn-Jick, to Western Electric Company, Incorporated. Method of etching a surface of a substrate comprising litao3 and chemically similar materials. 3,860,467, Cl. 156-17.000.

Limb, John Ormond: *See—*
Cutler, Cassius Chapin; Limb, John Ormond; and Rubinstein, Charles Benjamin, 3,860,953.

Lindell, Joseph S.; and Noullett, Richard G. Voltage polarity sensor indicator and director circuit device. 3,860,868, Cl. 324-133.000.

Lindemann, Wolfgang. Dye composition of benzyl alcohol, phenyl glycol ether and octylphenyl pentaglycol ether. 3,860,390, Cl. 8-93.000.

Lindemuth, Laurence D.; Whitehead, Donald K.; and Fronczek, Chester, to Continental Oil Company. Odor reduction in alcohols. 3,860,520, Cl. 260-643.00F.

Lindskog, Bo Gosta, to Sandvik Aktiebolag. Cutting tool. 3,859,699, Cl. 29-96.000.

Liska, Manfred; and Metzger, Jurgen, to Siemens Aktiengesellschaft. Circuit for controlling the thread velocity in winding equipment with a traversing mechanism. 3,860,187, Cl. 242-45.000.

Lit-Ning Products Co.: *See—*
Irvine, David; Barlow, Earl; Carnes, John K.; and Schmidt, William F., 3,860,119.

Litton Business Systems, Inc.: *See—*
Madison, Theodore N., 3,860,103.

Ljubimov, Evgeny Mikhailovich: *See—*
Rabodzei, Nikolai Vasilievich; Astrin, Vladimir Alexandrovich; Kuzmicheva, Nina Vasilievna; Shidlovsky, Gennady Vladimirovich; Ljubimov, Evgeny Mikhailovich; and Nadobnikov, Mikhail Nikolaevich, 3,860,819.

Lloyd, William A., to Versatec, Inc. Printing machine with electrostatic web developing apparatus. 3,859,960, Cl. 118-637.000.

Lockard, Joseph Larue, to AMP Incorporated. Momentary switch with wire spring components. 3,860,776, Cl. 200-276.000.

Locke, Edward V.: *See—*
Hoag, Ethan D.; and Locke, Edward V., 3,860,887.

Locke Stove Company: *See—*
Smith, Donald R., 3,859,978.

Lodi, Fernando: *See—*
Romano, Giuliano; Buonaprole, Ferruccio; and Lodi, Fernando, 3,859,948.

Loev, Bernard, to SmithKline Corporation. 2-Alkoxy-3-amino-2-heterocyclic-thiopropanamides. 3,860,592, Cl. 260-247.10M.

Loma Corporation: *See—*
Hawk, Bob R., 3,860,141.

Loro, Alberto: *See—*
Hamer, Colin A.; Loro, Alberto; and Payne, John R., 3,859,723.

Los Angeles Miniature Products, Inc.: *See—*
Carley, James A., 3,860,847.

Lovely, John W., to Bryant Grinder Corporation. Reed mounted chuck. 3,860,251, Cl. 279-4.000.

Lovich, John W.; Meller, Oscar W.; and Morse, Frank C., to Goodyear Aerospace Corporation. Cargo container latch and door. 3,860,138, Cl. 220-1.500.

Lowell, Seymour. Apparatus for measuring surfaces by mercury intrusion. 3,859,843, Cl. 73-38.000.

Lowi, Alvin, Jr.; and Wright, Clifford C. Liquid separation system. 3,860,492, Cl. 202-236.000.

LTG Lufttechnische GmbH: *See—*
Furstenberg, Joachim, 3,859,779.

Lu, Robert T., to ICI United States Inc. Photopolymerization of ethylenically unsaturated organic compounds. 3,860,429, Cl. 96-115.00P.

Ludloff, Wolfgang, to Multiblitz Dr.-Ing. D. A. Mannesman GmbH & Co. KG. Flash lamp system. 3,860,853, Cl. 315-178.000.

Ludwig, Clarence H. Process for grinding cutting edges on blades. 3,859,762, Cl. 51-285.000.

Luitwieler, Samuel H., Jr.; and Klein, Paul R., to Beckman Instruments, Inc. Gamma ray spectrometer display means. 3,860,823, Cl. 250-369.000.

Lukas, Josef; and Illig, Dietmar, to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH. Multiple flashlamp unit. 3,860,810, Cl. 240-1.300.

Lukasik, John A.; and McCarthy, Patrick J., to Ford Motor Company. Adjustable connection. 3,860,353, Cl. 403-351.000.

Lunden, Sidney L., to Moore-IEM, Inc. Sticker placing apparatus for lumber stacking machines. 3,860,128, Cl. 214-6.00M.

Lundquist, Ulf Rolfsson, to Forenabe Fabriksverken. Sealing device for prevention of leakage between cylindrical surfaces. 3,860,250, Cl. 277-165.000.

Lundt, Behren M. Freidrich: *See—*
Christensen, Haldor; Lundt, Behren M. Freidrich; Gronwald, Frederick Christian; and Andersen, William, 3,860,619.

Lundt, Behrend Friedrich, to Novo Terapeutisk Laboratorium A/S. 3-Aminoalkyloxyindoles. 3,860,608, Cl. 260-326.150.

Lundt, Behrend Friedrich, to Novo Terapeutisk Laboratorium A/S. 3-Aminoalkyloxyindoles. 3,860,609, Cl. 260-326.150.

Luscher, Paul, to Jos. Hunkeler AG Fabrik fur graphische Maschinen. Glue applicator, especially for endpaper gluing. 3,859,958, Cl. 118-261.000.

Lutz, Gerhard, to Tyrolit-Schleifmittelwerke Swarovski K.G. Segmental grinding wheel. 3,859,761, Cl. 51-206.500.

Lyman, Joseph, to Cambridge Thermionic Corporation. Virtually zero powered magnetic suspension. 3,860,300, Cl. 308-10.000.

Lynn, William J.; and Seeger, Richard E., to Chomerics, Inc. Keyboard switch assembly with dome shaped actuator having associated underlying contactor means. 3,860,771, Cl. 200-5.00A.

Lyons, Donald W. Trailer hitch bar. 3,860,267, Cl. 280-478.00B.

M & J Valve Company: *See—*
Grove, Marvin H.; and Dunegan, Ronald G., 3,860,033.

Maag, Helmut: *See—*
Krall, Heribert A.; and Maag, Helmut, 3,859,829.

Maake, Douglas Herman, to Gould Inc. Heating element assembly. 3,860,789, Cl. 219-532.000.

Machado, Joseph: *See—*
French, Alan; and Machado, Joseph, 3,860,139.

Machine Tool Divisional Services Limited: *See—*
Hodgson, Brian, 3,859,893.

Mackiernan, Stuart W. Device for applying facial cosmetics. 3,860,016, Cl. 132-83.00B.

MacLeay, Ronald Edward: *See—*
Sheppard, Chester Stephen; MacLeay, Ronald Edward; and Bafford, Richard Anthony, 3,860,674.

Maddox, Jim, Jr.: *See—*
Tate, Jack F.; and Maddox, Jim, Jr., 3,860,071.

Madison, Theodore N., to Litton Business Systems, Inc. Segment shift arrangement. 3,860,103, Cl. 197-74.000.

Maeder, Arthur: *See—*
Abel, Heinz; Hostettler, Hans; Berger, Alfred; Toepfl, Rosemarie; and Maeder, Arthur, 3,860,540.

Mahajan, Gautam K.; and Suthard, Robert A., to Continental Can Company, Inc. Noise reduction housing for a can bodymaker. 3,860,086, Cl. 181-33.00K.

Maier, Christian, to Ciba-Geigy Corporation. Aerosol dispenser for fluid products comprising a piston pump assembly for generating compressed air serving as propellant and a product metering device. 3,860,150, Cl. 222-193.000.

Maistrelli, Roger, to Regie Nationale Des Usines Renault. Electrohydraulic device for lifting tractor-drawn agricultural implements. 3,860,074, Cl. 172-7.000.

Makino, Shozaburo; Otobe, Seiji; and Yamamoto, Shinichi, to Nippon-Seren Co., Ltd. Rotation detector in a fixed length yarn winding apparatus. 3,860,185, Cl. 242-36.000.

Malone, James T.; Brennan, Richard L.; and Hollock, Donald D., to United States of America, Navy. Receiver for desk signals. 3,860,874, Cl. 325-320.000.

Maltby, Frederick L.; and Kramer, L. Jonathan, to Drexelbrook Controls, Inc. Continuous condition measuring system. 3,860,882, Cl. 330-26.000.

Mandel, Alan F.: *See—*
Zitelli, William E.; and Mandel, Alan F., 3,860,914.

Mangold, Dietrich: *See—*
Zanker, Fritz; and Mangold, Dietrich, 3,860,623.

Manners-Smith, John; Thompson, Christopher Garth; and Tinning, Peter, to Ferranti Limited. Friction braking apparatus. 3,860,096, Cl. 188-134.000.

Mannesmann Aktiengesellschaft: *See—*
Von Klenck, Jurgen, 3,859,933.

Mappin, Henry, to Dobson Park Industries Limited. Mining, rock breaking, excavating machine and implement. 3,860,290, Cl. 299-32.000.

Mar, Bob: *See—*
yung, Michael A.; and Mar, Bob, 3,860,135.

Marchant, Alan: *See—*
January, John Kenneth; and Marchant, Alan, 3,860,668.

Marchant, Paul A.: *See—*
Kinslow, William G., Jr.; Marchant, Paul A.; Bessier, Robert D.; and Hafele, Robert X., 3,860,375.

Marconi Company Limited, The: *See—*
Fitz, Philip John, 3,860,864.

Marcuzzi, Anthony T., to Ford Motor Company. Vehicle window regulator mechanism. 3,859,753, Cl. 49-103.000.

Marek, Donald C.: *See—*
Borowski, Norbert P.; Marek, Donald C.; Panek, Bruno J.; and Klaviter, Walter F., 3,860,131.

Marek, Ralf Stellan: *See—*
Fanto-Kuertoes, Peter Robert; and Marek, Ralf Stellan, 3,860,370.

Marendaz, Georges-Andre, to Ateliers des Charmilles S.A. Method and apparatus for positioning an electrode-tool relative to a workpiece in electrical discharge machining. 3,860,779, Cl. 219-69.00G.

Marietta, Charles W.: *See—*
Marietta, Michael T.; and Marietta, Charles W., 3,859,666.

Marietta, Michael T.; and Marietta, Charles W. Crown cushion member. 3,859,666, Cl. 2-3.00R.

Markant, Henry P.: *See—*
Strom, Steven S.; and Markant, Henry P., 3,860,402.

Marshall, Franklin N., to Dow Chemical Company, The. Antagonism of ethanol intoxication with 2-[(3,4-dichlorophenoxy)methyl]-2-imidazoline. 3,860,719, Cl. 424-273.000.

Marshall, John W., to International Business Machines Corporation. Data resynchronization employing a plurality of decoders. 3,860,907, Cl. 340-146.10D.

Martens, Gust H.; and Runyan, Phillip E. Low center of gravity trailer. 3,860,252, Cl. 280-2.000.

Marti, Peter. Closure for containers. 3,860,152, Cl. 222-545.000.

Martin, Bernard P.: *See—*
Beach, Sidney C.; and Martin, Bernard P., 3,860,638.

Martin, Billy M.: *See—*
Workman, Wilton L.; and Martin, Billy M., 3,860,466.

Martin, Henry; Pissiotas, Georg; and Rohr, Otto, to Ciba-Geigy AG. N-0-nitrophenylpropargyl-carbamate. 3,860,632, Cl. 260-471.00C.

Martin, Julian Clark. Board game apparatus. 3,860,242, Cl. 273-134.0AE.

Martin, Kenneth Watt; and Moniak, John, to International Telephone and Telegraph Corporation. Electronic tone generator. 3,860,764, Cl. 179-84.00T.

Martin, Leon Z.; and Weaver, Benjamin Z., to Burkholder Paving, Inc. Dump truck tailgate actuator. 3,860,288, Cl. 298-23.0MD.

Martin, Louis E.: *See—*
Bacquie, Serge B.; and Martin, Louis E., 3,859,790.

Martin, Merrill D. Adjustable stacker layboy. 3,860,232, Cl. 271-198.000.

Martin, Thomas E.; and Horvath, John C., to United States of America, Army. Method of manufacturing a consolidated double base sheet propellant. 3,860,678, Cl. 264-3.00A.

Marvin Glass & Associates: *See—*
McKay, Robert S., 3,859,750.
Morrison, Howard J.; and Nix, Donald F., 3,859,752.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Moll, Hans; and Hagen, Hans, 3,860,081.

Maschinenfabrik Buckau R. Wolf Aktiengesellschaft: *See—*
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Maschinenfabrik Nuckau R. Wolf Aktiengesellschaft: *See—*
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Mashizu, Isutomu: *See—*
Orii, Masayoshi; Saito, Takayuki; Saito, Ryuji; Kawase, Susumu; Mashizu, Isutomu; and Watanabe, Masayoshi, 3,860,747.

Maslennikov, Jury Ivanovich: *See—*
Krylov, Alexandr Iosifovich; Myshko, Vladimir Semenovich; Smirnov, Leonid Stepanovich; Maslennikov, Jury Ivanovich; Vikulov, Igor Makarovich; Gontarenko, Alexandr Nikolaevich; Korovyanko, Alexandr Dmitrievich; and Zaitsev, Valery Pavlovich, 3,859,824.

Mason, Clyde P., Jr.: *See—*
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Mason, Jerry E.: *See—*
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Massberg, Wolfgang: *See—*
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Mast, Aquila D., to Sperry Rand Corporation. Hay roll forming machine. 3,859,909, Cl. 100-88.000.

Mastik, Emil A., to Kahle Engineering Co. Glass rod slug molding machine. 3,860,408, Cl. 65-174.000.

Mastranardi, Pasquale J., to Estey Corporation. Track supporting means. 3,860,171, Cl. 238-304.000.

Masuda, Koichiro; and Tasaka, Katsuhiko, to Mitsui Petrochemical Industries, Ltd. Hot-melt compositions. 3,860,543, Cl. 260-28.5AV.

Material Metrics, Inc.: *See—*
Hruby, Ronald J., 3,859,844.

Mathais, Henri: *See—*
Borrel, Marcel; Mathais, Henri; and Thevenon, Marcel, 3,860,495.

Mathis, David G.: *See—*
Frank, Robert; and Mathis, David G., 3,860,266.

Matsubayashi, Hiroshi: *See—*
Tsurumaru, Michiko; Matsubayashi, Hiroshi; Sano, Hiroki; Suzuki, Yukio; and Ueno, Hiroshi, 3,860,398.

Matsubayashi, Saburo; and Takano, Kaoru, to Mitsubishi Jukogyo Kabushiki Kaisha. Multi-section screw extruder. 3,860,220, Cl. 259-192.000.

Matsumoto, Hisao: *See—*
Kazaoka, Kenichi; Hirose, Kimiharu; Takeshita, Yasuo; and Matsumoto, Hisao, 3,860,260.

Matsuno, Hiroshi; and Endo, Ichiro, to Canon Kabushiki Kaisha. Photoconductive element with unsaponified alkyl vinyl ether-maleic anhydride copolymer interlayer. 3,860,422, Cl. 96-1.500.

Matsuo, Shunji; Sato, Shui; Ishikawa, Hidehiko; Nakamura, Shinichi; and Taguchi, Masahiko, to Konishiroku Photo Industry Co., Ltd. Quick-processable light-sensitive color photographic material. 3,860,427, Cl. 96-87.00R.

Matsushita Electric Industrial Co., Ltd.: *See—*
Akamine, Takenori, 3,860,960.
Imanishi, Kaoru; and Inoue, Hisayoshi, 3,860,957.
Kawasaki, Itaru; Kobayashi, Kazutsugu; and Igarashi, Yoshiaki, 3,860,843.
Kozu, Isao; and Kurihara, Hidetoshi, 3,860,964.
Kubo, Shuji; and Itoh, Tohru, 3,860,956.

Matsushita, Shigeo; Sumimoto, Toru; and Uchida, Teiji, to Nippon Electric Company, Limited. Electric field displacing type optical isolator. 3,860,325, Cl. 350-96.0WG.

Mattel, Inc.: *See—*
Douglas, Raymond J.; Libby, Edward W.; and Moquin, Leonard R., 3,860,264.
Morin, Marius J.; Hegel, James D.; Hampy, Vere S.; and Shield, Richard L., 3,859,749.

Matuschek, Max: *See—*
Kinsky, Siegfried; Segaert, Jan; Matuschek, Max; and Koeppe, Wolfgang, 3,859,722.

Matzner, Eva; and Sternbeck, Olaf, to Telefonaktiebolaget L M Ericsson. Method for obtaining an accurately determined high resistance in a resistor produced in a single crystalline substrate. 3,860,465, Cl. 156-8.000.

Mauser-Werke Aktiengesellschaft: *See—*
Pecksen, Otto, 3,859,746.

Mayer, Robert, to Sun Oil Company. Plural-header blending system. 3,860,030, Cl. 137-563.000.

Mayer, William N., to Control Data Corporation. Planar plasma discharge display panel. 3,860,846, Cl. 313-491.000.

McCabe, Edward J.; and Westphal, Donald E., to Mek-Tronix Laboratories Corporation. Telephone number generator. 3,860,755, Cl. 179-90.00B.

McCain, David L.; Haworth, Gordon R.; and Umphrey, Ronald W., to Continental Oil Company. 180° Loop carrier for a slurry line. 3,860,027, Cl. 137-344.000.

McCain, James Herndon, Jr.; and Foster, Louis, to Union Carbide Corporation. Purification of glyoxal. 3,860,656, Cl. 260-601.00R.

McCarthy, John H.: *See—*
Gautreaux, Marcelian F.; McCarthy, John H.; Foster, Walter E.; Hutchinson, Donald O.; and Frey, Frederick W., 3,860,415.
Gautreaux, Marcelian F.; McCarthy, John H.; Foster, Walter E.; Hutchinson, Donald O.; and Frey, Frederick W., Jr., 3,860,416.

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McCarthy, Patrick J.: *See—*
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McCaully, Ronald J.: *See—*
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McClune, David J.: *See—*
Cunningham, Michael P.; and McClune, David J., 3,860,426.

McColgin, William C.; and Chapman, Derek D., to Eastman Kodak Company. Dye laser and method. 3,860,886, Cl. 331-94.50L.

McCord Corporation: *See—*
Hulten, Richard E., 3,860,279.

McCoy, Frederic C.: *See—*
Cole, Edward L.; and McCoy, Frederic C., 3,860,531.

McDonald, Howard E.; and Caffall, James E. Portable air conditioner unit for use in mines and other like restricted areas. 3,859,816, Cl. 62-239.000.

McDowell, Donald G., Jr.: *See—*
Armstrong, William J.; and McDowell, Donald G., Jr., 3,859,932.

McGauley, Patrick J.; and Dor, Abraham A. Production of iron sulfate monohydrate. 3,860,696, Cl. 423-558.000.

McGraw-Edison Company: *See—*
Schmidt, Jacob E., 3,860,453.

McKay, Robert S., to Marvin Glass & Associates. Figure toy. 3,859,750, Cl. 46-42.000.

McKiddy, Dewfred R., to International Business Machines Corporation. Method of detecting misregistration of internal layers of a multilayer printed circuit panel. 3,859,711, Cl. 29-593.000.

McKinney, Joel D.: *See—*
Henke, Alfred M.; and McKinney, Joel D., 3,860,510.

McLafferty, George H., to United Aircraft Corporation. Gas laser expansion nozzles. 3,860,885, Cl. 331-94.50P.

McLaughlin, Carol Lynn: *See—*
Baile, Clifton A.; McLaughlin, Carol Lynn; and Webb, Robert Lee, 3,860,723.

McMurray, William C.; and Charneski, Mitchell D., to Detroit Edison Company, The. Method and apparatus for joining the ends of aluminum conductors by castwelding. 3,860,062, Cl. 164-333.000.

McMurtry, David Roberts; and Harris, Derek Percival, to Rolls-Royce (1971) Limited. Multi-bladed fans. 3,860,361, Cl. 416-120.000.

McQuiddy, David N., Jr.; and Blocker, Truman G., to Texas Instruments Incorporated. Broadband low noise parametric amplifier. 3,860,879, Cl. 330-4.900.

Mc Vay, George W.; and Stansbury, Thomas A. Vessels. 3,859,681, Cl. 9-6.000.

McWhorter, Edward M. Internal combustion engine - combustion control piston. 3,859,976, Cl. 123-197.00A.

Mead Corporation, The: *See—*
Calvert, Rodney K.; and Fishback, Alton J., 3,859,773.
Wood, Prentice J., 3,860,281.

Meade, Hazel W.: *See—*
Blanco, Louis A.; and Meade, Hazel W., 3,860,471.

Meagher, Thomas. Constant current biasing transfer system. 3,860,436, Cl. 117-17.500.

Medeiros, Anthony F.: *See—*
Ehrlich, Stanley L.; and Medeiros, Anthony F., 3,860,901.

Medema, Dirk: *See—*
Pilgram, Kurt H.; Medema, Dirk; Soloway, Samuel B.; and Gaertner, George W., 3,860,658.

Medical Incorporated: *See—*
Anderson, Lawrence, 3,859,668.

Medney, Jonas. Connection of plastic pipes with ground wires embedded therein. 3,860,742, Cl. 174-84.00S.

Meise, William: *See—*
Everhart, Norman; Herman, James; and Meise, William, 3,860,748.

Meister, Pierre-Andre: *See—*
Schwab, Michel; and Meister, Pierre-Andre, 3,860,842.

Mek-Tronix Laboratories Corporation: *See—*
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Melcher, Franz-Josef: *See—*
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Meller, Oscar W.: *See—*
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Menard, Christophe: *See—*
Chretien, Gilbert; Girard, Philippe; Lamy, Jean-Marc; and Menard, Christophe, 3,860,555.

Merck & Co., Inc.: *See—*
Hinkley, David F.; and Conn, John B., 3,860,659.
Hoffsommer, Robert D.; and Taub, David, 3,860,616.
Morse, Lewis D.; and Hammes, Paul A., 3,860,733.
Schultz, Everett M., 3,860,639.
Shen, Tsung-Ying; and Jones, Howard, 3,860,636.
Shuman, Richard F., 3,860,628.
Wolf, Frank J.; and Miller, William J., 3,860,703.

Merckardt, Volker. Multi-chamber container. 3,860,114, Cl. 206-219.000.

Mescherov, Rakhim Ainudinovich: *See—*
Vasiliev, Atlant Anatolievich; Mescherov, Rakhim Ainudinovich; Murin, Boris Pavlovich; and Stavissky, Jury Yakovlevich, 3,860,828.

Mesly, Xavier. Self-tracking bogie assembly for a tractor or trailer vehicle. 3,860,257, Cl. 280-81.00A.

Metaframe Corporation: *See—*
Willinger, Allan H.; and Dinnerstein, Albert J., 3,859,961.

Mettler Instrumente AG: *See—*
Utzinger, Diethelm; and Kunz, Peter, 3,860,077.

Metzger, Adolf; Scholderer, Jorg; and Schreiber, Horst, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for the manufacture of sodium pyrosulfite. 3,860,695, Cl. 423-519.000.

Metzger, Jurgen: *See—*
Liska, Manfred; and Metzger, Jurgen, 3,860,187.

Metzger, Karl Georg: *See—*
Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,860,714.
Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,860,715.

Meyer, Frank: *See—*
Toussaint, Dietrich; and Meyer, Frank, 3,859,949.

Meyer, Hans Rudolf, to Ciba-Geigy AG. 4,4′-Bis-[benzoxazolyl-(2)]-stilbenes. 3,860,584, Cl. 260-240.0CA.

Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt. 2,6-Diamino-1,4-dihydropyridine derivatives. 3,860,601, Cl. 260-295.50R.

Meyerhoff, Arthur E., Sr. Shelter for use adjacent the side of a swimming pool. 3,859,673, Cl. 4-172.000.

Michael Huber Munchen: *See—*
Uhlemayr, Albert; and Traitteur, Heinz, 3,860,670.

Microsystems International Limited: *See—*
Hamer, Colin A.; Loro, Alberto; and Payne, John R., 3,859,723.

Midland-Ross Corporation: *See—*
Hemsath, Klaus H.; Schmidt, Harry Dean; and Thekdi, Arvind C., 3,860,221.

Migliaccio, Crescent A. Latch hook device. 3,860,155, Cl. 223-104.000.

Mihailovski, Alexander, to Stauffer Chemical Company. Method of controlling undesired vegetation. 3,860,410, Cl. 71-99.000.

Mikami, Masakatsu: *See—*
Kubota, Ikuo; Mikami, Masakatsu; Konaka, Isao; and Misaki, Toshihiko, 3,860,699.

Mikelson, Artur Eduardovich: *See—*
Gavar, Valdis Valdovich; Dindun, Alexandr Stanislavovich; Kramer, Mark Maximovich; Platatsis, Ernest Yanovich; Mikelson, Artur Eduardovich; and Tomson, Elmar Yanovich, 3,860,825.

Miles Laboratories, Inc.: *See—*
Hong, Enrique, 3,860,717.

Milin, Biljana Bicky; and Milin, Ivan. Fluid flow measuring device. 3,859,852, Cl. 73-204.000.

Milin, Ivan: *See—*
Milin, Biljana Bicky; and Milin, Ivan, 3,859,852.

Milke, Howard W.: *See—*
Latassa, Frank M.; Milke, Howard W.; and Sadoski, Tadius T., 3,860,852.

Millar, John M.; and Moran, William F., to Beatrice Foods Co. Electrostatic method of applying multilayer coating and product produced thereby. 3,860,557, Cl. 260-41.00R.

Miller, Paul Marcus, to Tangen Drives, Inc. Full recycle cap feeder. 3,860,145, Cl. 221-159.000.

Miller, Wayne F.; and Lehner, Francis E., to Pasadena Institute of Technology. Seismic system with data compression. 3,860,759, Cl. 179-15.55R.

Miller, William J.: *See—*
Wolf, Frank J.; and Miller, William J., 3,860,703.

Mills, John Edward. Interior ventilation system with side view mirror de-icing. 3,859,899, Cl. 98-2.000.

Mims, Herman Dewitt, to D and B Machine Company. Vertical carton erector. 3,859,896, Cl. 93-51.00R.

Minaker, Warren M.: *See—*
Boxer, Leo M.; and Boxer, Robert W., 3,860,133.

Minami, Muneyoshi; and Taniguchi, Masaharu, to Toray Industries, Inc. Method of preparing a soluble high molecular weight aromatic polyamide imide composition. 3,860,559, Cl. 260-47.0CP.

Minami, Shinsaku: *See—*
Nakagawa, Kazumi; Kuratani, Keijiro; Minami, Shinsaku; and Keiichi, Zoda, 3,860,685.

Miner, Kenneth G.; Talcott, Thomas D.; Davidson, James B.; and Batdorf, David B., to Dow Corning Corporation. Flat drain. 3,860,008, Cl. 128-350.00R.

Minnesota Mining and Manufacturing Company: *See—*
Barber, Loren L., Jr., 3,860,565.
Johnson, James R., 3,860,535.
Larson, Roger L., 3,859,957.
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Misaki, Toshihiko: *See—*
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Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
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Mitsui, Nobuo; Kameyama, Tadao; Watanabe, Akinori; Fukushima, Isao; and Hatakeyama, Takanobu, to Hitachi, Ltd. Elevator driving system. 3,860,093, Cl. 187-29.00R.

Mitsui Petrochemical Industries, Ltd.: *See—*
Masuda, Koichiro; and Tasaka, Katsuhiko, 3,860,543.

Mitsui Shipbuilding & Engineering Co., Ltd.: *See—*
Kozeki, Moribumi, 3,859,964.

Mitsunari, Tetsuya, to Toppan Moore Business Forms Co. Ltd. Letter punch. 3,859,726, Cl. 30-358.000.

Miyauchi, Toshiyuki; and Ohtsuka, Kunio, to Nissan Motor Company, Limited. Line pressure modulating device for an automatic power transmission. 3,859,873, Cl. 74-867.000.

Miyazato, Teruhiko. Lining agent for a tubeless pneumatic tire. 3,860,539, Cl. 260-4.00R.

Mizuno, Yukio, to Nissan Motor Company, Limited. Warp tension control mechanism. 3,860,044, Cl. 139-109.000.

Mizutani, Kazumi: *See—*
Ota, Hiroshi; and Mizutani, Kazumi, 3,860,927.

Mizzy, A. Robert; and Pierannunzi, Vito L., to Mizzy, Inc. Multi-dose injector. 3,859,996, Cl. 128-173.00H.

Mizzy, Inc.: *See—*
Mizzy, A. Robert; and Pierannunzi, Vito L., 3,859,996.

Mobil Oil Corporation: *See—*
Heiba, El Ahmadi I.; and Dessau, Ralph M., 3,860,612.

Model, Ernst; and Gati, Sandor, to Ciba-Geigy Corporation. Iminoisoindolinone dyestuffs. 3,860,604, Cl. 260-308.00B.

Modig, Torsten. Dry closets. 3,859,672, Cl. 4-111.000.

Moeller, Axel, to Moeller Manufacturing Co., Inc. Marine bailer plug. 3,859,945, Cl. 114-197.000.

Moeller Manufacturing Co., Inc.: *See—*
Moeller, Axel, 3,859,945.

Moen, George A. Flexible spout closure device. 3,860,151, Cl. 222-513.000.

Moll, Hans; and Hagen, Hans, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Drive system for motor vehicles, particularly for truck-trailer and truck semi-trailer combinations. 3,860,081, Cl. 180-14.00A.

Moller, Jens L., to Continental Can Company, Inc. Apparatus for and method of die forming and perforating pilfer-proof band of closure caps. 3,859,942, Cl. 113-121.00A.

Molochnikov, Nikolai Vladimirovich; Patrikeev, Vladimir Sergeevich; Charny, Abram Khaimovich; and Schepkin, Viktor Alexeevich. Device for receiving metal ingots being cut off in the course of continuous casting. 3,860,123, Cl. 214-1.0QG.

Momoi, Toshimitsu: *See—*
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Moniak, John: *See—*
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Monsanto Company: *See—*
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Donermeyer, Donald D.; and Corey, Albert E., 3,860,553.
Hammann, William C.; and Schisla, Robert M., 3,860,661.
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Montecantini Edison S.p.A.: *See—*
Natta, Giulio; Severini, Febo; Portolani, Augusto; and Tavazzani, Carlo, 3,860,442.

Montillier, Jean Pierre, to Pitney-Bowes, Inc. Copolymer compositions and method of preparation. 3,860,552, Cl. 260-33.6UA.

Moore, Beal P.; and Dussia, Raymond J., to Atlas Valve Company. Fluid level control system and fluid level actuated controller therefor. 3,860,028, Cl. 137-411.000.

Moore, Earl P., Jr., to du Pont de Nemours, E. I., and Company. Method of forming refractory laminates. 3,860,476, Cl. 156-297.000.

Moore-IEM, Inc.: *See—*
Lunden, Sidney L., 3,860,128.

Moquin, Leonard R.: *See—*
Douglas, Raymond J.; Libby, Edward W.; and Moquin, Leonard R., 3,860,264.

Moran, Robert J.; Pateuk, Constantine J.; and LeBlanc, Larry M., to Photocircuits Division of Kollmorgan Corporation. Motion control system for direct current motors, particularly in sewing machine uses. 3,860,860, Cl. 318-375.000.

Moran, William F.: *See—*
Millar, John M.; and Moran, William F., 3,860,557.

Morgan, John R.: *See—*
Donakowski, William A.; Morgan, John R.; and Roemming, Karl, 3,860,058.

Mori, Kazuo: *See—*
Ishizumi, Kikuo; Mori, Kazuo; Okamoto, Tadashi; Akase, Takeshi; Izumi, Takahiro; Akatsu, Mitsuhiro; Kume, Yoshiharu; Inaba, Shigeho; and Yamamoto, Hisao, 3,860,575.

Mori, Masafumi, to Tokyo Shibaura Electric Co., Ltd. Optical signal reproducing apparatus. 3,860,766, Cl. 179-100.40R.

Mori, Toshiyuki: *See—*
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Morikawa, Yasuo: *See—*
Okabe, Masanaga; Nakamura, Hiroshi; Sakata, Sumio; Kawasaki, Iwawo; and Morikawa, Yasuo, 3,860,434.

Morin, Marius J.; Hegel, James D.; Hampy, Vere S.; and Shield, Richard L., to Mattel, Inc. Power tool toys. 3,859,749, Cl. 46-39.000.

Morrill, Russell C., to Morworth Enterprises, Inc. Programming guide. 3,860,795, Cl. 235-61.12N.

Morris, George H., to Morris Rod-Weeder Co. Ltd. Row crop rotary rod weeder. 3,860,075, Cl. 172-44.000.

Morris, Herbert Keith, to Girling Limited. Vehicle brakes. 3,860,095, Cl. 188-71.800.

Morris, John Charles, to Singer Company, The. Tape feed mechanism. 3,860,192, Cl. 242-75.400.

Morris Rod-Weeder Co. Ltd.: *See—*
Morris, George H., 3,860,075.

Morrison, Howard J.; and Nix, Donald F., to Marvin Glass & Associates. Toy vehicle having means for canting wheels on collision. 3,859,752, Cl. 46-201.000.

Morse, Frank C.: *See—*
Lovich, John W.; Meller, Oscar W.; and Morse, Frank C., 3,860,138.

Morse, Lewis D.; and Hammes, Paul A., to Merck & Co., Inc. Microencapsulated product. 3,860,733, Cl. 426-302.000.

Morworth Enterprises, Inc.: *See—*
Morrill, Russell C., 3,860,795.

Moscatello, Charles L., to GTE Sylvania Incorporated. Furnace and method for induction heating moving quantities of material. 3,860,737, Cl. 13-27.000.

Mosciatti, Roger: *See—*
Klang, Daniel M.; and Mosciatti, Roger, 3,860,814.

Moskwinski, John A. Brush. 3,859,684, Cl. 15-23.000.

Motorenfabrik Hatz KG: *See—*
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Motorola, Inc.: *See—*
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Mueller, David W.: *See—*
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Mueller, Jakob: *See—*
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Muhlbach, Anton, to USM Corporation; and USM Corporation. High frequency welding and cutting machines. 3,859,912, Cl. 100-257.000.

Mullen, David R.: *See—*
Richards, Peter G.; Mullen, David R.; and Hall, Douglas E., 3,860,157.

Muller, Albert: *See—*
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Multiblitz Dr.-Ing. D. A. Mannesman GmbH & Co. KG: *See—*
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N L Industries: *See—*
Stroud, Stanley G.; and Estes, James D., 3,860,865.

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Houlihan, William J.; and Nadelson, Jeffrey, 3,860,649.

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Weakley, Martin L., 3,860,411.

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Imamura, Kennosuke; Kikuchi, Toshio; and Kanazawa, Shunichi, 3,860,603.

Nippon Chemical Works Co., Ltd.: *See—*
Tanaka, Toshiki, 3,860,587.

Nippon Electric Company, Limited: *See—*
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Orii, Masayoshi; Saito, Takayuki; Saito, Ryuji; Kawase, Susumu; Mashizu, Isutomu; and Watanabe, Masayoshi, 3,860,747.

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Nippon Kogaku K.K.: *See—*
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Nippon-Seren Co., Ltd.: *See—*
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Tamura, Yasumitsu; Murayama, Masao; Seto, Eisuke; Yoshimoto, Yoshihiko; and Wada, Hisayuki, 3,860,640.

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Orii, Masayoshi; Saito, Takayuki; Saito, Ryuji; Kawase, Susumu; Mashizu, Isutomu; and Watanabe, Masayoshi, 3,860,747.

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Shinoi, Tsuyoshi; and Murakami, Toyoshige, 3,860,756.
Sudoh, Kengo; and Ichikawa, Mikihiro, 3,860,763.
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Nippondenso Co., Ltd.: *See—*
Sugiura, Akio; Okamoto, Atsutoshi; and Suzuki, Motoyoshi, 3,860,830.

Nishikawa, Takehiko: *See—*
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Nissan Motor Company, Limited: *See—*
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Mizuno, Yukio, 3,860,044.

Nissler, Siegfried: *See—*
Huber, Norbert; Nissler, Siegfried; and Schneider, Hans, 3,860,944.

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Beisch, Hans R., 3,860,295.
Willms, Charles F., 3,860,073.

Nospil Limited: *See—*
Schutz, Frank C., 3,860,162.

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Lindell, Joseph S.; and Noullett, Richard G., 3,860,868.

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Diamond, Julius; and Novick, William J., Jr., 3,860,648.

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Christensen, Haldor; Lundt, Behren M. Freidrich; Gronwald, Frederick Christian; and Andersen, William, 3,860,619.
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Stone, Gerald P., 3,860,824.

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Adamski, Robert J.; and Numajiri, Satoru, 3,860,651.

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Hansen, Hans; Hauffe, Dieter; Hehn, Karl-Heinz; Nuss, Karl-Heinz; Rausch, Werner; Rothkegel, Josef; and Wimmers, Peter, 3,860,455.

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Tepas, Joseph J., Jr.; and Sangster, Arlon G., 3,860,394.

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Walus, Richard L.; and Olson, Gary E., 3,860,117.

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Bubley, Henry J.; and Oltra, Claude H., 3,859,917.

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Pearce, Joseph L.; Sizer, Phillip S.; and Taylor, Donald F., 3,860,066.

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Bartlow, David H.; and Greenwood, Mark E., 3,860,478.

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Nystrand, Ernst Daniel, 3,860,004.

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Brunn, Louis W.; Frayer, James A.; and Paraskos, John A., 3,860,511.

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Parker, Robert E.: *See—*
Dell, William; and Parker, Robert E., 3,860,862.

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Kloth, James Albert; Parsons, Stuart L.; Zimmerman, John Aaron, Jr.; and Vigeant, George Henry, deceased, 3,860,739.

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Sheppard, Chester Stephen; MacLeay, Ronald Edward; and Bafford, Richard Anthony, 3,860,674.

Penty, Robert A.: *See—*
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Perlberg, William: *See—*
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Perlman, Sheldon E.; and Ion, John C., to Teleflex Incorporated. Method for assembling roller bearing remote control cables. 3,859,702, Cl. 29-148.40A.

Perry, Ernest J.: *See—*
Ponticello, Ignazio S.; Perry, Ernest J.; and Tuites, Richard C., 3,860,428.

Persson, Staffan B., to Bausch & Lomb Incorporated. Refractor with a synchronized cylinder lens axis and cross cylinder lens axis. 3,860,330, Cl. 351-29.000.

Pesch, Jurgen, to G. Siempelkamp & Co. Apparatus for the production of pressed board. 3,860,381, Cl. 425-338.000.

Peschel, Heinz; and Radtke, Manfred, to Eastman Kodak Company. Take-up drive for cinematographic apparatus. 3,860,198, Cl. 242-205.000.

Pessa, Edmund L.: *See—*
Baird, James L.; Pessa, Edmund L.; and Silk, James C., 3,860,491.

Peter, Richard; and Angliker, Hans-Joerg, to Ciba-Geigy AG. Disperse azo dyestuffs containing the residue of an aryl monoester of an aliphatic dicarboxylic acid. 3,860,572, Cl. 260-207.000.

Peters, Albert: *See—*
Reinhardt, Helmut; Brandt, Bernd; and Peters, Albert, 3,860,682.

Peterschinegg, Hans: *See—*
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Peterson, Gary E.: *See—*
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Peterson, Leroy: *See—*
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Peterson, Richard W.: *See—*
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Peterson, Robert K., to Texas Instruments Incorporated. Radar antenna scan apparatus. 3,860,930, Cl. 343-705.000.

Peterson, Russell Irving, to Cumberland Engineering Company, Inc. Auger feed granulator. 3,860,182, Cl. 241-186.00A.

Petrow, Henry G.; and Allen, Robert J. Antimony oxide colloidal sol, formulation and method of preparing the same. 3,860,523, Cl. 252-8.100.

Petrus, Steve, to Eagle-Picher Industries, Inc. Clamp for air filter hose. 3,860,273, Cl. 285-244.000.

Petrushka, Edward M., to Rockwell International Corporation. Airfoil. 3,860,200, Cl. 244-42.0CC.

Peyton, Edward E.: *See—*
Buchholz, James J.; and Peyton, Edward E., 3,860,160.

Pfeiffer, Richard D. Jig measuring tool and use of the same. 3,859,729, Cl. 33-181.0AT.

Pfizer Inc.: *See—*
Carroll, Ronnie D.; Hamanaka, Ernest S.; Pirie, Donald K.; and Welch, Willard M., Jr., 3,860,585.
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Photocircuits Division of Kollmorgan Corporation: *See—*
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Picker Corporation: *See—*
Dove, Robert L., 3,859,982.

Piepenbreier, Ernst: *See—*
Korn, Gerhard; and Piepenbreier, Ernst, 3,859,929.

Pierannunzi, Vito L.: *See—*
Mizzy, A. Robert; and Pierannunzi, Vito L., 3,859,996.

Pierre, Bernard, to Etat Francais. Rotor feed for an automatic firearm supplied by a single link hook and eye chain belt. 3,859,891, Cl. 89-33.0CA.

Pilgram, Kurt H.; Medema, Dirk; Soloway, Samuel B.; and Gaertner, George W., to Shell Oil Company. Hydroxyaryl thioethers. 3,860,658, Cl. 260-607.00B.

Pilgrim, Kurt H. G.; and Skiles, Richard D., to Shell Oil Company. Dihydrotetrazine herbicides. 3,860,588, Cl. 260-241.000.

Pilgrim, Kurt H. G.; and Skiles, Richard D., to Shell Oil Company. Tetrazine herbicides. 3,860,589, Cl. 260-241.000.

Pillsbury Company, The: *See—*
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Pioneer Electronic Corporation: *See—*
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Pipe Supports Limited: *See—*
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Pirie, Donald K.: *See—*
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Pissiotas, Georg: *See—*
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Pitney-Bowes, Inc.: *See—*
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Hinman, Bruce E.; Cinque, Gregory M.; and Soltow, William D., Jr., 3,860,911.
Labore, Walter T., 3,859,955.
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Platatsis, Ernest Yanovich: *See—*
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Platner, James B.; and Schaefer, Charles M., III, to Bethlehem Steel Corporation. Gasketed watertight segmented tunnel linings. 3,859,802, Cl. 61-45.00R.

Platt, Ethan A. Automatic irrigation apparatus. 3,860,172, Cl. 239-65.000.

Platt, Frederick C., to Flex-o-Lators, Inc. Seating construction. 3,860,287, Cl. 297-452.000.

Plessey Incorporated: *See—*
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Polaroid Corporation: *See—*
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Baker, Philip G.; and Hoomes, William A., 3,860,329.

Polysuis AG: *See—*
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Polytop Corporation: *See—*
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Pommer, Horst; Reif, Werner; Pasedach, Heinrich; and Hoffmann, Werner, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of 6,10-dimethylundecatriene-(3,5,10)-one-(2). 3,860,654, Cl. 260-595.000.

Pommer, Horst; Reif, Werner; Pasedach, Heinrich; and Hoffmann, Werner, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of 6,10-dimethylundecatrien-(3,5,10)-one-(2). 3,860,655, Cl. 260-595.000.

Ponticello, Ignazio S.; Perry, Ernest J.; and Tuites, Richard C., to Eastman Kodak Company. Silver halide peptizers containing bis(-thioether) linkages. 3,860,428, Cl. 96-114.000.

Pope, Donald Geoffrey; and Kirkby, Rodney John, to Post Office, The. Ship-borne gravity stabilized antenna. 3,860,931, Cl. 343-709.000.

Popovic, Djordje R.; and Sarrafian, Vahram K., to Wico Corporation. Solenoid. 3,860,894, Cl. 335-258.000.

Porlein, Gerhard: *See—*
Fischer, Artur; Porlein, Gerhard; and Killgus, Theo, 3,860,323.

Porret, Daniel: *See—*
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Porter, Clyde R.: *See—*
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Porter, Percy L.; and Porter, Clyde R., to P. L. Porter Co. Hydraulic locking device. 3,860,098, Cl. 188-300.000.

Portolani, Augusto: *See—*
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Porvair Limited: *See—*
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Possis Corporation: *See—*
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Post Group: *See—*
Post, Stephen F., 3,859,868.

Post Office, The: *See—*
Pope, Donald Geoffrey; and Kirkby, Rodney John, 3,860,931.

Post, Stephen F., to Post Group. Inertial energy storage apparatus. 3,859,868, Cl. 74-572.000.

Potter Instrument Company, Inc.: *See—*
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Power-Gas Limited: *See—*
Harris, Norman; Flintoff, Frederick Joseph; and Reid, Robert, 3,860,534.

Power Research & Development, Inc.: *See—*
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Powers Regulators Company: *See—*
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PPG Industries, Inc.: *See—*
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Prather, George A.: *See—*
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Prideaux, Jean Paul: *See—*
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Pries, Erich E., to Dr. C. Otto & Comp. G.m.b.H. Cover apparatus for pipes conducting distillation gases from coke ovens. 3,860,493, Cl. 202-254.000.

Priestley, Joseph A.: *See—*
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Primark Corporation: *See—*
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Prisco, Anthony J., Sr. Putting aid device for use on putters. 3,860,243, Cl. 273-165.000.

Procter & Gamble Co., The: *See—*
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Produits Chimiques Ugine Kuhlman: *See—*
Borrel, Marcel; Mathais, Henri; and Thevenon, Marcel, 3,860,495.
Proebstle, Robert J. Fishing equipment holder. 3,859,747, Cl. 43-54.50R.
Prottey, Frederick Vernon, to Dunlop Limited. Valve assemblies. 3,860,054, Cl. 152-415.000.
Prout, Brian John, to U.S. Philips Corporation. Method of delivering the intestines of human beings from bariumsulphate after barium meal examination. 3,860,708, Cl. 424-180.000.
Prowse, Derek Henry George; and Prowse, Stephen Derek, to D. H. Prowse and Company Limited. Flexible abrasive coverings. 3,860,400, Cl. 51-295.000.
Prowse, Stephen Derek: *See—*
Prowse, Derek Henry George; and Prowse, Stephen Derek, 3,860,400.
Pullman Transport Leasing Co.: *See—*
Adler, Franklin P., 3,859,928.
Putnin, Aina Yanovna; Shvarts, Evgenia Mikhailovna; Ermush, Nina Avgustovna; levinsh, Alfred Fritsevich; and Kalninsh, Arvid Yanovich, to Institut Neorganicheskoi Khimii. Methods for the preparation of borotrihydroxyglutarate. 3,860,626, Cl. 260-462.00R.
Pye Limited: *See—*
Firth, John Richard, 3,860,328.
Richardson, John Bernard; and Sharpe, Anthony Keith, 3,860,872.
Rabodzei, Nikolai Vasilievich; Astrin, Vladimir Alexandrovich; Kuzmicheva, Nina Vasilievna; Shidlovsky, Gennady Vladimirovich; Ljubimov, Evgeny Mikhailovich; and Nadobnikov, Mikhail Nikolaevich. Closed-circuit-tv-x-ray microscope. 3,860,819, Cl. 250-358.000.
Radtke, Manfred: *See—*
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Ragard, Phillip A.; and Paton, James W., to Universal Instruments Corporation. Electronic component semi-automatic assembly machine. 3,859,707, Cl. 29-203.00B.
Raillere, Raymond; and Fulachier, Georges Edward, to Etat Francais. Method and apparatus for testing for phosphor particles contained in the atmosphere. 3,860,345, Cl. 356-87.000.
Ralston Purina Company: *See—*
Paugh, George W., 3,860,452.
Ramanathan, Visvanathan, to Ciba-Geigy AG. Basic azo dyestuffs from an 1-aryl-5-hydroxy-or-amino-pyrazole coupling component. 3,860,571, Cl. 260-156.000.
Ramanathan, Visvanathan: *See—*
Hegar, Gert; and Ramanathan, Visvanathan, 3,860,620.
Rampe, John F., to Rampe Research. Vibratory finishing machine with reversible eccentric drive. 3,859,759, Cl. 51-163.000.
Rampe Research: *See—*
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Rapean, John C.; and Shaw, Paul V., to Shell Oil Company. Multi-stage distillation of bicycloheptadiene. 3,860,497, Cl. 203-82.000.
Rapid Mounting and Finishing Company: *See—*
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Rasmussen, Keith O., to Hek Manufacturing Company, Inc. Split back dental chair apparatus. 3,860,286, Cl. 297-408.000.
Ratcliffe, Charles T.; Hardin, Charles V.; Anderson, Lowell R.; and Fox, William B., to Allied Chemical Corporation. Perfluoro organic hydroperoxides. 3,860,660, Cl. 260-610.00R.
Rattcliff, Graham; and Kemp, Ronald Sidney Thomas, to Jermyn, Thomas. Circuit board. 3,860,313, Cl. 339-17.00C.
Rauch, Glenn A.; and Hess, Robert E., to Dresser Industries, Inc. Continuous cutting and gathering apparatus for a continuous mining machine. 3,860,291, Cl. 299-67.000.
Rauen, John T. Power transmission system and method. 3,859,971, Cl. 123-119.00R.
Rausch, Werner: *See—*
Hansen, Hans; Hauffe, Dieter; Hehn, Karl-Heinz; Nuss, Karl-Heinz; Rausch, Werner; Rothkegel, Josef; and Wimmers, Peter, 3,860,455.
Rawle, Derek T.: *See—*
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Ray, Jack C.: *See—*
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Raymond Lee Organization, Inc., The: *See—*
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Kaplan, Marx, 3,859,819.
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Raytheon Company: *See—*
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Ehrlich, Stanley L.; and Medeiros, Anthony F., 3,860,901.
Ehrlich, Stanley L., 3,860,928.
RCA Corporation: *See—*
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Caprari, Fausto, 3,860,335.
Dawson, Robert Herman, 3,860,945.
Okamoto, Fumio, 3,860,423.
Stoeckert, Alvin John; and Hunt, James Martin, 3,860,949.
Vossen, John Louis, Jr., 3,860,507.
Realist, Inc.: *See—*
Graef, John N., 3,860,333.
Reavis, Robert Philmore, Jr.; Roberts, Lincoln Edwin; and Shoemaker, John Robert, to AMP Incorporated. Pre-loaded electrical connector. 3,860,318, Cl. 339-99.000.
Reber, John B., Jr.: *See—*
Guy, Arthur L.; and Reber, John B., Jr., 3,859,806.
Reckdahl, Segwald J., to Minnesota Mining and Manufacturing Company. Data processing form. 3,860,790, Cl. 235-61.11E.
Reehil, Edward G., to Xerox Corporation. Adjustable fadeout control. 3,860,338, Cl. 355-14.000.
Regie Nationale Des Usines Renault: *See—*
Maistrelli, Roger, 3,860,074.
Reichhold-Albert-Chemie Aktiengesellschaft: *See—*
Katsimbas, Themistoklis; Dalibor, Horst; Kiessling, Hans-Joachim; and Schmidt, Rolf, 3,860,563.
Reid, Robert: *See—*
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Reif, Werner: *See—*
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Pommer, Horst; Reif, Werner; Pasedach, Heinrich; and Hoffmann, Werner, 3,860,655.
Reighart, June H. Ladle maintenance safety cage. 3,860,060, Cl. 164-152.000.
Reinhardt, Helmut; Brandt, Bernd; and Peters, Albert. Processing of finely divided particulate materials. 3,860,682, Cl. 264-92.000.
Reinhardt, Robert L. Earth moving process. 3,859,741, Cl. 37-8.000.
Reinink, Frits, to U.S. Philips Corporation. Hot-gas reciprocating apparatus with power control device. 3,859,792, Cl. 60-521.000.
Reiter Industries, Inc.: *See—*
Reiter, Jerome A., 3,860,018.
Reiter, Jerome A., to Reiter Industries, Inc. Method of aerating and cleaning a milk tank. 3,860,018, Cl. 134-22.00R.
Renault, Claude; and Sleghem, Michel, to Pechiney-Saint Gobain Produits Chimiques. Colorant compositions and method. 3,860,392, Cl. 8-169.000.
Renda, Philip; and Rozett, Lawrence, to Singer Company, The. Split support frame for circular knitting machines. 3,859,822, Cl. 66-8.000.
Renfrew, Edgar E., to American Aniline Products, Inc. Polyester fabric dyed with a nitrobenzotriazole-azo-(dihydroxyalkylamino)-acylanilide acylated in an alkylamide solution. 3,860,389, Cl. 8-26.000.
Repas, Paul E., to United States Steel Corporation. Hot-rolled high-strength low-alloy steel and process for producing same. 3,860,456, Cl. 148-12.00F.
Rescalli, Carlo, both of: *See—*
Ginnasi, Alessandro; and Rescalli, Carlo, both of, 3,860,496.
Research Corporation: *See—*
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Rey-Bellet, Gerald; and Spiegelberg, Hans, to Hoffmann-La Roche Inc. Tricyclic compounds and processes. 3,860,615, Cl. 260-340.900.
Reynolds Products Inc.: *See—*
Neumann, Charles G.; and Peterson, Leroy, 3,859,902.
Rheem International, Inc.: *See—*
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Rheinstahl AG: *See—*
Jeuken, Josef; Vieregge, Gustav; and Massberg, Wolfgang, 3,859,830.
Korn, Gerhard; and Piepenbreier, Ernst, 3,859,929.
Rhone-Poulenc S.A.: *See—*
Chabert, Henri; Aime, Robert; Gigiou, Claude; and Ruaud, Michel, 3,860,568.
Rhone-Progil: *See—*
Chretien, Gilbert; Girard, Philippe; Lamy, Jean-Marc; and Menard, Christophe, 3,860,555.
Richards, Peter G.; Mullen, David R.; and Hall, Douglas E. Back pack and frame. 3,860,157, Cl. 224-8.00R.
Richardson, John Bernard; and Sharpe, Anthony Keith, to Pye Limited. Multiple receiver selection system. 3,860,872, Cl. 325-304.000.
Richardson-Merrell Inc.: *See—*
Grisar, J. Martin; and Parker, Roger A., 3,860,722.
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Leonardo, Onofrio; Giorgio, Giacomo; and Esposito, Francesco, 3,860,607.
Richter, Sidney B.; and Krenzer, John, to Velsicol Chemical Corporation. Compositions of matter. 3,860,643, Cl. 260-545.00R.
Richter, Sidney B.: *See—*
Krenzer, John; and Richter, Sidney B., 3,860,644.
Ricoh Co. Ltd.: *See—*
Namiki, Ryoichi; and Kawano, Haruyoshi, 3,860,857.
Riello Condizionatori S.A.S. di Giordano Riello & C.: *See—*
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Riello, Valerio Giordano, to Riello Condizionatori S.A.S. di Giordano Riello & C. Moistening device. 3,860,063, Cl. 165-60.000.
Rieter Machine Works, Ltd.: *See—*
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Riken Light Metal Industries Co., Ltd.: *See—*
Ikegaya, Masashi; and Shigeta, Fumio, both of, 3,860,503.
Riker Laboratories, Inc.: *See—*
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Riley, Robert. Manually operated corner bending device. 3,859,834, Cl. 72-319.000.
Ringstad, John E., to Tape-Athon Corporation. Fm transmission system. 3,860,873, Cl. 325-308.000.
Risko, Bernard L.: *See—*
Calder, Brooke J., Jr.; Risko, Bernard L.; and Belock, Robert J., 3,860,677.

Rittenbach, Otto E., to United States of America, Army. Electronic time compressor or expander. 3,860,760, Cl. 179-15.55T.

Ritzerfeld, Gerhard. Method of making a hectographic master. 3,859,920, Cl. 101-467.000.

Ritzman, Horst, to Polysuis AG. Reduction of ore in a rotary drum. 3,860,417, Cl. 75-36.000.

Riv-Skf Officine di Villar Perosa S.p.A.: *See—*
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Rives, George S.: *See—*
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Riviere, Henry W.: *See—*
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Robert Bosch Fernsehanlagen G.m.b.H.: *See—*
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Robert Bosch G.m.b.H.: *See—*
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Robert Bosch Photokino G.m.b.H.: *See—*
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Ziegler, Karl, 3,860,332.

Roberts, Alan Gregson; Wilkins, Dennis Malcolm; and Wright, Malcolm Arthur, to Cool Industry (Patents) Limited. Fluidised bed combustors. 3,859,963, Cl. 122-4.00D.

Roberts, George Leathwhite, Jr.: *See—*
Dokuzoguz, Halit Zafer; and Roberts, George Leathwhite, Jr., 3,860,412.

Roberts, Lincoln Edwin: *See—*
Reavis, Robert Philmore, Jr.; Roberts, Lincoln Edwin; and Shoemaker, John Robert, 3,860,318.

Roberts, Miron J.; and Runge, Heinz F., to Kraftco Corporation. Apparatus for making cheese. 3,859,905, Cl. 99-454.000.

Robertshaw Controls Company: *See—*
Katchka, Jay R., 3,860,170.

Robinette, William C., Jr., to Texas Instruments Incorporated. Method for fabricating semiconductor devices utilizing composite masking. 3,860,461, Cl. 148-187.000.

Roccheggiani, Guido G.; and Faessinger, Robert W., to Scott Paper Company. Printing fluid. 3,860,548, Cl. 260-29.40R.

Roccheggiani, Guido G.: *See—*
Faessinger, Robert W.; and Roccheggiani, Guido G., 3,860,547.

Rockwell International Corporation: *See—*
Caswell, Robert L., 3,860,855.
Green, Robert D.; and Heimbigner, Gary L., 3,859,717.
Petrushka, Edward M., 3,860,200.

Rodgers, Fletcher. Blow out preventer. 3,860,067, Cl. 166-121.000.

Rodgers, Fletcher. Ball joint pipe coupling. 3,860,271, Cl. 285-97.000.

Rodriguez, Rafael. Lift trailer. 3,860,255, Cl. 280-43.190.

Roe, Malcolm David; Donald, John Henry; Chappell, Peter Lee; Kirk, Malcolm; Edwards, John David; and Greenham, Stanley Keith, to Dataplex Limited. Apparatus for reproducing programmed selections of data recorded in coded form on magnetic cards. 3,860,793, Cl. 235-61.90R.

Roemming, Karl: *See—*
Donakowski, William A.; Morgan, John R.; and Roemming, Karl, 3,860,058.

Rogers, Gerald L., to Chemetron Corporation. Ball valve with flow control. 3,860,032, Cl. 137-614.170.

Rogers, Gerald L. Extensible arm structure. 3,860,350, Cl. 403-104.000.

Rohm and Haas Company: *See—*
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Rohr, Otto: *See—*
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Rollei-Werke Franke & Heidecke: *See—*
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Rolls-Royce (1971) Limited: *See—*
McMurtry, David Roberts; and Harris, Derek Percival, 3,860,361.

Romano, Giuliano; Buonaprole, Ferruccio; and Lodi, Fernando. Apparatus for cleaning hulls and other submerged surfaces. 3,859,948, Cl. 114-222.000.

Romans, Gleason, to Aviation, Inc. Power supply monitoring device. 3,860,912, Cl. 340-152.00T.

Romney, Russell H., to Child Resistant Packaging, Inc. Child-resistant enclosure for hazardous materials. 3,860,136, Cl. 215-222.000.

Ronemus, David C., to Westinghouse Electric Corporation. Vibration monitoring device using accelerometer to measure displacement. 3,859,847, Cl. 73-70.000.

Ropars, Raymond; and Herve, Jean Yves, to Societe Lignes Telegraphiques et Telephoniques. Wide band active circuit three-port circulator for ultra-high frequencies and microwaves. 3,860,893, Cl. 333-80.00R.

Rosales, Joseph G.: *See—*
King, Orville D.; and Rosales, Joseph G., 3,859,788.

Roscher, Alfred M., to PPG Industries, Inc. Bobbin for textile fibers. 3,860,194, Cl. 242-118.320.

Rose, Edgar: *See—*
Turner, Robert K.; and Rose, Edgar, 3,859,967.

Rosenkranz, Hans Jurgen; Lachmann, Burkhard; and Rudolph, Hans, to Bayer Aktiengesellschaft. Process for the production of benzylidene compounds. 3,860,598, Cl. 260-287.00R.

Ross, Gray Ernest Donald, to Zenith Carburetter Company Limited, The. Cold starting devices for internal combustion engines. 3,859,974, Cl. 123-179.00G.

Rotar, Emil: *See—*
Feuer, Peter R.; and Rotar, Emil, 3,860,239.

Roth, Howard: *See—*
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Rothrock, Elmer Weyman: *See—*
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Rouse, Donald E. Detergent holder on windshield wiper arm. 3,859,689, Cl. 15-250.030.

Rowe, Edward A., to Diamond Shamrock Corporation. Tube plugging device. 3,860,037, Cl. 138-89.000.

Rowenta-Werke GmbH: *See—*
Lamprecht, Adolf, 3,860,863.

Roy, Laura C. Garment constructions. 3,859,667, Cl. 2-212.000.

Rozett, Lawrence: *See—*
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RTE Corporation: *See—*
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Rubino, Andrew M.; Gilman, William S.; and Jones, John L., to Armour Pharmaceutical Company. Antimicrobial compositions containing aluminum halide compounds. 3,860,705, Cl. 424-157.000.

Rubinstein, Charles Benjamin: *See—*
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Rudd, Wallace C.; and Udall, Humfrey N., to Thermatool Corporation. Melt welding by high frequency electrical current. 3,860,778, Cl. 219-67.000.

Rudolph, Hans: *See—*
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Runge, Heinz F.: *See—*
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Rupp, Warren E., to Warren Rapp Company, The. Slide valve. 3,860,034, Cl. 137-625.250.

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Ryan, Daniel J., to FMC Corporation. Film thickness measuring method and apparatus. 3,860,820, Cl. 250-360.000.

S. C. Johnson & Son: *See—*
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Sage Products, Inc.: *See—*
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Saito, Ryuji: *See—*
Orii, Masayoshi; Saito, Takayuki; Saito, Ryuji; Kawase, Susumu; Mashizu, Isutomu; and Watanabe, Masayoshi, 3,860,747.

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Tarui, Yasuo; Komiya, Yoshio; and Sakamoto, Tsunenori, 3,860,916.

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Sakoda, Shunsuke; and Tanaka, Yoshinori, to Sony Corporation. Electronic computer system. 3,860,808, Cl. 235-156.000.

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Sam Stein Associates, Inc.: *See—*
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Samama, Lydie Esther, administratrix: *See—*
Viout, Andre; and Esanu, David, deceased, 3,860,700.
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Saric, Ivan M. Washing device for combs and the like. 3,860,021, Cl. 134-140.000.
Sarrafian, Vahram K.: *See—*
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Sartorius-Werke GmbH: *See—*
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Sata, Naoyasu. Non-polluting combustion engine having ultrasonic fuel atomizer in place of carburetor. 3,860,173, Cl. 239-102.000.
Sato, Kazuo: *See—*
Yamanaka, Teruo; Kato, Takayuki; Ozeki, Osamu; Sato, Kazuo; and Bito, Minoru, 3,860,923.
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Sauer, Wolfgang, to ITT Industries, Inc. Synchronization system for watches. 3,859,781, Cl. 58-28.00A.
Sawai, Joe Y.: *See—*
Johnson, Roger E.; and Sawai, Joe Y., 3,860,125.
Sawhill, Jades M., Jr., to American Metal Climax, Inc. Process for welding low-alloy steels containing niobium. 3,860,777, Cl. 219-61.000.
Sawyer, James T., to United States of America, National Aeronautics and Space Administration. Leak detector. 3,859,845, Cl. 73-49.200.
Sayles, David C., to United States of America, Army. Non lead-containing ballistic modifiers. 3,860,462, Cl. 149-19.800.
Sayles, David C., to United States of America, Army. Propellant composition containing triferrocenylmethyl perchlorate as catalytic oxidizer. 3,860,463, Cl. 149-19.900.
Scaggs, Lee E.: *See—*
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Schackelford, W. T. Ticket dispensing machine. 3,859,880, Cl. 83-205.000.
Schaefer, Charles M., III: *See—*
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Schaefer Corporation: *See—*
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Schaffner, Donald L., to Fiat - Allis Construction Machinery, Inc. Endless track for vehicle. 3,860,299, Cl. 305-57.000.
Schagen, Pieter; King, Hewson Nicholas Graham; and Washington, Derek, to U.S. Philips Corporation. Channel plate with color selection electrodes and color phosphors. 3,860,849, Cl. 313-400.000.
Schaller, Robert L., to Sundstrand Syracuse, Inc. Power programming system for a centerless grinder. 3,859,755, Cl. 51-103.0TF.
Schauls, James J., to Trane Company, The. Distributor for plate type heat exchanger having side headers. 3,860,065, Cl. 165-166.000.
Scheer, Marcel: *See—*
Kaiser, Ado; Koch, Wolfgang; Scheer, Marcel; and Wolcke, Uwe, 3,860,630.
Schenk, Roy U.; and Bjorksten, Johan. Preparation of oligomers of microenzymes. 3,860,485, Cl. 195-66.00R.
Schepkin, Viktor Alexeevich: *See—*
Molochnikov, Nikolai Vladimirovich; Patrikeev, Vladimir Sergeevich; Charny, Abram Khaimovich; and Schepkin, Viktor Alexeevich, 3,860,123.
Scherer, Richard A., to du Pont de Nemours, E. I., and Company. Angular welding process and apparatus. 3,860,468, Cl. 156-73.500.
Schick Incorporated: *See—*
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Schiefelbein, Benedict: *See—*
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Schiltknecht, Adolf; and Lattion, Andre, to Rieter Machine Works, Ltd. Method and apparatus for winding yarn from open end spinning devices. 3,860,186, Cl. 242-45.000.
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Schmidgall, Hertzell H. Apparatus for making manholes of concrete. 3,860,214, Cl. 249-144.000.
Schmidt, Dietmar: *See—*
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Schmidt, Harry Dean: *See—*
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Schmidt, Jacob E., to McGraw-Edison Company. Non-spill vent valve for liquid electrolyte battery. 3,860,453, Cl. 136-177.000.
Schmidt, Paul Herman; and Spencer, Edward Guerrant, to Bell Telephone Laboratories, Incorporated. Ion etching through a pattern mask. 3,860,783, Cl. 219-121.0EM.
Schmidt, Rolf: *See—*
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Schmidt, William F.: *See—*
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Schmitt, Ernst, to Bayer Aktiengesellschaft. Indolenine dyestuffs. 3,860,583, Cl. 260-240.00G.
Schmuck, Johann: *See—*
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Schneider, Arthur, to Rollei-Werke Franke & Heidecke. Diffusing screen for photographic lighting. 3,860,812, Cl. 240-46.030.
Schneider, Hans: *See—*
Huber, Norbert; Nissler, Siegfried; and Schneider, Hans, 3,860,944.
Schneider, Hans-Dieter, to Robert Bosch Fernsehanlagen G.m.b.H. Method and arrangement for compensating for stray light effects in television cameras. 3,860,751, Cl. 178-7.200.
Schneider, Mark: *See—*
Duffek, Edward F.; Funk, Ernest J.; Jankowski, Alfred S.; Lane, Jack C.; Lehner, William L.; Oliver, Floyd F.; and Schneider, Mark, 3,859,715.
Schneiter, Ali, to Ebauches S.A. Electric watch with electrodynamic motor. 3,859,784, Cl. 58-28.00D.
Schoenberg, Shlomo; and Yellin, Haim, to Teva Middle East Pharmaceutical & Chemical Works Ltd. Derivatives of 4-chloro-5-sulfamoyl-anthranilic acid. 3,860,582, Cl. 260-239.600.
Schoenung, Alois F., to Rapid Mounting and Finishing Company. Tumbling display device. 3,859,743, Cl. 40-33.000.
Scholderer, Jorg: *See—*
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Schreiber, Horst: *See—*
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Schuler, Roland H., to BBC Brown Boveri & Company Limited. Insulated conductor bar structure for stator winding of high-voltage dynamo-electric machine. 3,860,744, Cl. 174-117.0FF.
Schultz, Everett M., to Merck & Co., Inc. [(2-Nitro-1-alkenyl)aryl]akanoic (and alkenoic)-acids and related compounds. 3,860,639, Cl. 260-515.00R.
Schulz, Hans Peter: *See—*
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Schuyler Development Corporation: *See—*
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Schwab, Michel; and Meister, Pierre-Andre, to Societe Suisse pour L'Industrie Horlogere Management Services S.A. Electromagnetic rotative step by step motor. 3,860,842, Cl. 310-49.000.
Schwartz, Charles: *See—*
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Schweizer, Gottfried, to Gertsch AG. Ski binding. 3,860,253, Cl. 280-11.35D.
Scott, Elizabeth. Bathing accessory for the back. 3,860,349, Cl. 401-8.000.
Scott Paper Company: *See—*
Faessinger, Robert W.; and Roccheggiani, Guido G., 3,860,547.
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Scudder, Ronald J., to Western Electric Company, Incorporated. Method of monitoring the position of towed underwater apparatus. 3,860,900, Cl. 340-3.00R.
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Seewer, Gustave Auguste: *See—*
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Sefton, Verner Blakey; Evans, David John Ivor; and Weir, Donald Robert, to Sherritt Gordon Mines Limited. Process for treating high magnesium nickeliferous laterites and garnierites. 3,860,689, Cl. 423-150.000.

Segaert, Jan: *See—*
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Segerson, Eugene E., to Motorola, Inc. Lead frame. 3,860,397, Cl. 29-191.600.

Seifert, Kurt, to Robert Bosch G.m.b.H. Fuel injection nozzle. 3,860,178, Cl. 239-533.000.

Seiko Koki Kabushiki Kaisha: *See—*
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Sekmakas, Kazys, to DeSoto, Inc. Thermosetting coating compositions comprising methylolated amide interpolymers of high acid content in combination with low molecular weight polyhydric alcohols. 3,860,549, Cl. 260-29.6TA.

Seleznev, Jury Emelyanovich: *See—*
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Selke, William A., to Kimberly-Clark Corporation. Method of producing a reconstituted tobacco product. 3,860,012, Cl. 131-140.00C.

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Semple, Charles A., to Engineered Concrete Placer, Inc. Modified slurry pump. 3,860,035, Cl. 137-625.470.

Senf, Henry R.: *See—*
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Senft, Alfred W., to Research Corporation. Novel method of diagnosis of schistosomiasis and reagents therefore. 3,860,483, Cl. 195-62.000.

Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, to Bayer Aktiengesellschaft. Antibacterial compositions and methods. 3,860,714, Cl. 424-250.000.

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Sermanni-Giovannozzi, Giovanni; and Cacciari, Isabella, to Consiglio Nazionale delle Richerche. Method of inhibiting viral lysis in nonhuman flora and fauna systems. 3,860,710, Cl. 424-195.000.

Seto, Eisuke: *See—*
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Shaner, Kenneth H.: *See—*
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Sharpe, Anthony Keith: *See—*
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Shaw, Larry K.: *See—*
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Shell Oil Company: *See—*
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Pilgram, Kurt H.; Medema, Dirk; Soloway, Samuel B.; and Gaertner, George W., 3,860,658.
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Pilgrim, Kurt H. G.; and Skiles, Richard D., 3,860,589.
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Shelton, Jack: *See—*
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Shema, Bernard F.; Brink, Robert H., Jr.; and Swered, Paul, to Betz Laboratories, Inc. Slime control compositions and their use. 3,860,516, Cl. 210-62.000.

Shema, Bernard F.; and Brink, Robert H., Jr., to Betz Laboratories, Inc. Slime control compositions and their use. 3,860,517, Cl. 210-62.000.

Shema, Bernard F.; Brink, Robert H., Jr.; and Swered, Paul, to Betz Laboratories, Inc. Slime controlling compositions and their use. 3,860,713, Cl. 424-246.000.

Shemdin, Byar Hazim, to Fiber Industries, Inc. Process for extruding filaments having asymmetric cross-section. 3,860,679, Cl. 264-40.000.

Shen, Tsung-Ying; and Jones, Howard, to Merck & Co., Inc. Substituted indenyl phosphonic acids having anti-inflammatory activity. 3,860,636, Cl. 260-502.40R.

Sheppard, Chester Stephen; MacLeay, Ronald Edward; and Bafford, Richard Anthony, to Pennwalt Corporation. Compounds having peroxy and aliphatic azo groups and methods using these as initiators. 3,860,674, Cl. 260-886.000.

Sherer, C. Richard; and Foyle, Russell M., to DND Corporation. Inside pipe cutter apparatus. 3,859,877, Cl. 82-82.000.

Sherin, Michael H., to Sage Products, Inc. Liquid container. 3,860,148, Cl. 222-153.000.

Sherman Car Wash Equipment Co.: *See—*
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Shernoff, Donald I.; and Simpson, James H., to United States of America, Navy. Apparatus for producing magnetic resonance cells. 3,860,311, Cl. 316-30.000.

Sherritt Gordon Mines Limited: *See—*
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Shersher, Yakov Isaevich. Artificial hip-joint and a method for its installation. 3,859,669, Cl. 3-1.000.

Sherwin, Peter G. Tiltable tray with pivotally mounted legs having extensible feet. 3,859,930, Cl. 108-6.000.

Shidlovsky, Gennady Vladimirovich: *See—*
Rabodzei, Nikolai Vasilievich; Astrin, Vladimir Alexandrovich; Kuzmicheva, Nina Vasilievna; Shidlovsky, Gennady Vladimirovich; Ljubimov, Evgeny Mikhailovich; and Nadobnikov, Mikhail Nikolaevich, 3,860,819.

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Shimizu, Kitao: *See—*
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Shimizu, Masami; and Jindai, Akio, to Citizen Watch Co., Ltd. Cutting device for an ultrasonic vibration system. 3,859,876, Cl. 82-36.00R.

Shinoi, Tsuyoshi; and Murakami, Toyoshige, to Nippon Tsu Shin Kogyo K.K.; and TIE/Communications, Inc. Automatic voice-path switching circuit for a speaker phone telephone set. 3,860,756, Cl. 179-1.0HF.

Shinonaga Kasei Co., Ltd.: *See—*
Kubota, Ikuo; Mikami, Masakatsu; Konaka, Isao; and Misaki, Toshihiko, 3,860,699.

Shinozaki, Takashi, to Victor Company of Japan, Ltd. Color image pickup device. 3,860,955, Cl. 358-44.000.

Ship Systems, Inc.: *See—*
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Shirvatov, Ardalion Dmitrievich: *See—*
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Shkundin, Lev Romanovich; Braginsky, Roman Pavlovich; Finkel, Eduard Emmanuilovich; and Leontiev, Jury Nikolaevich. Method of creating treating zone for multistage treatment of flexible long-length articles. 3,860,159, Cl. 226-4.000.

Shoemaker, Carlyle E., to Bethlehem Steel Corporation. Flux and method of coating ferrous article. 3,860,438, Cl. 117-50.000.

Shoemaker, John Robert: *See—*
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Short, George E., to G. D. Searle & Co. Method for use and compositions of 11-lower alkyl steroids and drug delivery system for the controlled elution of 11-lower alkyl steroids. 3,860,701, Cl. 424-81.000.

Shoupp, William E.; Bratkowski, Walter V.; and Esposito, John N., to Westinghouse Electric Corporation. Photoflash lamp-reflector module and miniature multiflash units for photographic cameras. 3,860,809, Cl. 240-1.300.

Showa Denko Kabushiki Kaisha: *See—*
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Shuman, Richard F., to Merck & Co., Inc Cyanomethyl(3-trifluoromethylphenoxy)(4-chlorophenyl)acetate. 3,860,628, Cl. 260-465.00D.

Shumka, Alex, to California Institute of Technology. Space-charge-limited solid-state triode. 3,860,946, Cl. 357-22.000.

Shutt, George F. Arrowhead setting device. 3,859,728, Cl. 33-180.00R.

Shvarts, Evgenia Mikhailovna: *See—*
Putnin, Aina Yanovna; Shvarts, Evgenia Mikhailovna; Ermush, Nina Avgustovna; Ievinsh, Alfred Fritsevich; and Kalninsh, Arvid Yanovich, 3,860,626.

Siegwart, Emil. Corrugated sheet material. 3,859,832, Cl. 72-180.000.

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Silk, James C.: *See—*
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Silverman, Daniel. Vibrator systems for generating elastic waves in the earth. 3,860,087, Cl. 181-0.5VM.

Silvern, David H.; Minton, Stanley J.; and Patel, Ghanshyam C., to Chicago Pneumatic Tool Company. Rotary compressor having improved control system. 3,860,363, Cl. 417-12.000.

Simmons, Smith H.; and Caraway, Mitchell R., to Standard Fabricated Products Co., The. Prefabricated multi story stair assembly method. 3,859,771, Cl. 52-741.000.

Simmons, Walter J., to du Pont de Nemours, E. I., and Company. Method for bonding oriented polyester films. 3,860,475, Cl. 156-285.000.

Simon, Peter J. Therapeutic equipment. 3,859,990, Cl. 128-66.000.

Simone, Dominic: *See—*
Herman, Daniel F.; and Simone, Dominic, 3,860,545.
Simplex Industries, Inc.: *See—*
Flotow, David W.; and Young, John C., 3,859,766.
Simpson, James H.: *See—*
Shernoff, Donald I.; and Simpson, James H., 3,860,311.
Simpson, Robert D., to Boeing Company, The. Automatic pitch axis control system for aircraft. 3,860,800, Cl. 235-150.220.
Singer Company, The: *See—*
Darboven, Ernest F., Jr., 3,860,925.
Morris, John Charles, 3,860,192.
Renda, Philip; and Rozett, Lawrence, 3,859,822.
Singer, M. Leonard; and Woletz, Robert M. Apparatus for securing office equipment at a remote station. 3,859,826, Cl. 70-58.000.
Sintab Swedinventor AB: *See—*
Wahlgren, Lars Osten, 3,859,734.
Sippel, Donald G.: *See—*
Allison, William D.; and Sippel, Donald G., 3,860,259.
Sirevicius, Paul, to Phillips Petroleum Company. Sheet extrusion die opening restriction device. 3,860,383, Cl. 425-461.000.
Sirvet, Enn: *See—*
Skrypek, John P.; Whelan, Edward J.; and Sirvet, Enn, 3,859,919.
Sizer, Phillip S.: *See—*
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Telek, Bela; and Skaper, Thomas, 3,860,421.
Skelly Oil Company: *See—*
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SKF Industrial Trading and Development Company B.V.: *See—*
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Skiles, Richard D.: *See—*
Pilgrim, Kurt H. G.; and Skiles, Richard D., 3,860,588.
Pilgrim, Kurt H. G.; and Skiles, Richard D., 3,860,589.
Skrypek, John P.; Whelan, Edward J.; and Sirvet, Enn, to Sun Chemical Corporation. Inker unit for continuous-motion printer. 3,859,919, Cl. 101-349.000.
Slater, Thomas S. Boxless electrical component. 3,860,319, Cl. 339-99.00R.
Slauter, John W. Variable-beam flashlight device. 3,860,811, Cl. 240-10.60R.
Sleghem, Michel: *See—*
Renault, Claude; and Sleghem, Michel, 3,860,392.
Smirnov, Leonid Stepanovich: *See—*
Krylov, Alexandr Iosifovich; Myshko, Vladimir Semenovich; Smirnov, Leonid Stepanovich; Maslennikov, Jury Ivanovich; Vikulov, Igor Makarovich; Gontarenko, Alexandr Nikolaevich; Korovyanko, Alexandr Dmitrievich; and Zaitsev, Valery Pavlovich, 3,859,824.
Smith, Donald R., to Locke Stove Company. Cooking device. 3,859,978, Cl. 126-25.00A.
Smith, James: *See—*
Boxer, Leo M.; and Boxer, Robert W., 3,860,133.
Smith, Matthew: *See—*
Neimark, Jack D.; and Smith, Matthew, 3,860,126.
Smith, Peter W.: *See—*
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Smith, Samuel W.: *See—*
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Berkoff, Charles E.; Di Tullio, Nicholas W.; and Weisbach, Jerry A., 3,860,716.
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Snell, Ford F., to Buckeye Steel Castings. Railway coupler shank. 3,860,121, Cl. 213-62.000.
Societa 'Italiana Resine S.I.R. S.p.A.: *See—*
Vargiu, Silvio; Giovanni, Sesto S.; Pitzalis, Mario; and Crespolini, Giancarlo, 3,860,561.
Societe Anonyme Automobiles Citroen: *See—*
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Societe D'Etudes Scientifiques et Industrielles de L'Ile-De-France: *See—*
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Societe Dite: Franciaflex: *See—*
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Societe Lignes Telegraphiques et Telephoniques: *See—*
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Societe Suisse pour L'Industrie Horlogere Management Services S.A.: *See—*
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Societe Suisse pour L'Industrie Horlogere Management Services SA: *See—*
Hetzel, Max, 3,860,844.
Sofec Inc.: *See—*
Pedersen, Kristen I.; and Cavanaugh, William F., 3,859,803.
Solis, Cruz Luevano. Vehicle wheel accessory mounting fixture and removable accessories therefor. 3,860,297, Cl. 301-38.00R.
Soloway, Samuel B.: *See—*
Pilgram, Kurt H.; Medema, Dirk; Soloway, Samuel B.; and Gaertner, George W., 3,860,658.
Soltow, William D., Jr.: *See—*
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Somerset, James H., to Biomechanics, Inc. X-ray cassette. 3,860,826, Cl. 250-480.000.
Sony Corporation: *See—*
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Spang Industries, Inc.: *See—*
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Spanke, Edwin A.; Carrieri, Louis F.; and Francey, Melvin H., to Gulf & Western Manufacturing Company. Drive unit for presses. 3,860,100, Cl. 192-18.00A.
Spauszus, Siegfried: *See—*
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Fichter, Manfred; Spauszus, Siegfried; and Warkentin, Ulrich, 3,860,807.
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Speckhart, Bernard S.: *See—*
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Speiser, Jeffrey M.; and Byram, George W., to United States of America, Navy. Cascade transversal filter amplitude-compensation network. 3,860,892, Cl. 333-70.00T.
Spencer, Edward Guerrant: *See—*
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Spengler, Ernst M., to Stanztechnik GmbH Roeder & Spengler. Cutting apparatus. 3,859,879, Cl. 83-155.000.
Speros, Gregory, to Bethlehem Steel Corporation. Straightener for a dispenser for coiled material. 3,859,836, Cl. 72-399.000.
Sperry Rand Corporation: *See—*
Mast, Aquila D., 3,859,909.
Spevack, Jerome S., to Deuterium Corporation. Dual temperature exchange systems suitable for isotopic exchange. 3,860,698, Cl. 423-580.000.
Spiegelberg, Hans: *See—*
Rey-Bellet, Gerald; and Spiegelberg, Hans, 3,860,615.
Spielberg, Theodore E. Therapeutic cuff. 3,859,989, Cl. 128-24.00R.
Spiller, Basil Harry Royston; and Phillipson, Alan, to Decca Limited. Apparatus for the manufacture of contoured records. 3,860,382, Cl. 425-384.000.
Spinner, Georg. Internal conductor male tubular member. 3,860,275, Cl. 285-334.400.
Spinnler, Rainer: *See—*
Zobel, Siegfried; Spinnler, Rainer; Ehgartner, Gabriele; and Hennig, Fridolin, 3,860,938.
Spisak, Edward G., to S & S Product Engineering Service, Inc. Wheel trim for different size wheels. 3,860,296, Cl. 301-37.0CD.
Squassoni, Gino F.: *See—*
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Squire, Lyle Eli: *See—*
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Stalder, Arnold F.; and Mueller, David W., to Texas Instruments Incorporated. Atmospheric pollution monitor. 3,860,818, Cl. 250-343.000.
Standard Fabricated Products Co., The: *See—*
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Standard Register Company, The: *See—*
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Staples, Paul R., to General Electric Company. Open wire heater element support. 3,860,788, Cl. 219-532.000.
Starks, Charles M., to Continental Oil Company. Method for preparing a magnetic substrate. 3,860,451, Cl. 117-240.000.

Stauffer Chemical Company: *See—*
Bruns, Carl Newton, 3,860,554.
Large, George B., 3,860,627.
Mihailovski, Alexander, 3,860,410.

Stauffer, Norman L., to Honeywell Inc. Auto focus camera. 3,860,935, Cl. 354-25.000.

Stavissky, Jury Yakovlevich: *See—*
Vasiliev, Atlant Anatolievich; Mescherov, Rakhim Ainudinovich; Murin, Boris Pavlovich; and Stavissky, Jury Yakovlevich, 3,860,828.

Steinmair, Karl: *See—*
Aschauer, Hans; and Steinmair, Karl, 3,860,781.

Stephens, Ronald L., to Xerox Corporation. Time-sharing two frequency laser. 3,860,888, Cl. 331-94.50C.

Stephenson, Robert L., to Allied Chemical Corporation. Detonator holder. 3,859,921, Cl. 102-22.000.

Sterling Drug Inc.: *See—*
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Ferrari, Richard A., 3,860,712.

Sterling Electronics Corporation: *See—*
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Sternbeck, Olaf: *See—*
Matzner, Eva; and Sternbeck, Olaf, 3,860,465.

Stewart, James A., to GTE Automatic Electric Laboratories Incorporated. Lowpass circuit for physical party line applications in subscriber carrier telephone system. 3,860,757, Cl. 179-2.50A.

Stickney, Michael E., to Durrum Instrument Corporation. Spring syringe drive apparatus. 3,859,859, Cl. 74-2.000.

Stinebaugh, Donald E., to Power Research & Development, Inc. Supercharged engines. 3,859,968, Cl. 123-75.0CC.

Stoeckert, Alvin John; and Hunt, James Martin, to RCA Corporation. Semiconductor mounting devices made by soldering flat surfaces to each other. 3,860,949, Cl. 357-65.000.

Stoepel, Kurt: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,860,601.

Stoick, John J. Snowmobile support dolly. 3,860,078, Cl. 180-5.00R.

Stolzer, Claus; Hammann, Ingeborg; and Unterstenhofer, Gunther, to Bayer Aktiengesellschaft. Halogenoalkanesulfonic acid amides. 3,860,646, Cl. 260-556.00A.

Stone, Gerald P., to Nuclear Services Corporation. Fluid driven in-core flux mapping probe system. 3,860,824, Cl. 250-390.000.

Stora Kopparbergs Bergslags Aktiebolag: *See—*
Josefsson, Erik Anders Ake; Johansson, Folke Kark Evald; Almqvist, Kurt Karl Axel; and Von Hoftsten, Carl Fredrik, 3,860,418.

Strandskov, Frede B.; and Bocklemann, John B., to F. & M. Schaefer Brewing Company, The. Preservation of beverages with poly(hexamethylenebiguanide hydrochloride). 3,860,729, Cl. 426-151.000.

Stratton, Lee N., III, to Honeywell Information Systems Inc. Rom multiple code conversion apparatus. 3,860,908, Cl. 340-146.1AG.

Strauss, Leopold, to Indian Head Inc. Bottle conveyor system including adjustable height continuous belt conveyor and positive lock spray shielded rotatable bottle carrier. 3,860,104, Cl. 198-240.000.

Strecker, William V., to Peck & Hale, Inc. Deck socket assembly. 3,860,209, Cl. 248-119.00R.

Streel, Dominique Thomas Francois Leon Joseph Marie: *See—*
Donckel, Georges Henri; and Streel, Dominique Thomas Francois Leon Joseph Marie, 3,860,444.

Strickland, Glenn L. Jumbo number printing device. 3,859,914, Cl. 101-76.000.

Strobach, Carl G., to Rheem International, Inc. Immersion type heating element with a plastic head for a storage water heater tank. 3,860,787, Cl. 219-336.000.

Strobe, Carl J.; and Wells, Robert A. Easy-open container with non-detached tab. 3,860,143, Cl. 220-269.000.

Strohschein, Clayton B., to Raymond Lee Organization, Inc., The, a part interest. Cable control system for transmitting power. 3,859,926, Cl. 104-178.000.

Strom, Steven S.; and Markant, Henry P., to Babcock & Wilcox Company, The. Absorption optimization. 3,860,402, Cl. 55-90.000.

Stroud, Stanley G.; and Estes, James D., to N L Industries. Selective firing indicator and recording. 3,860,865, Cl. 324-51.000.

Strukel, Marlene R., to Bendix Corporation, The. Method and apparatus for producing a fairing contour in numerical control systems. 3,860,805, Cl. 235-152.000.

Stuart, Gerald L.; and Paschal, Forrest A. Brick regrouping method. 3,860,132, Cl. 214-152.000.

Stutz, Theo; and Muller, Albert. Multistable circuit arrangement. 3,860,834, Cl. 307-289.000.

Submarine Engineering Associates, Inc.: *See—*
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Sudbury Engineering: *See—*
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Sudoh, Kengo; and Ichikawa, Mikihiro, to Nippon Tsu Shin Kogyo K.K.; and TIE/Communications, Inc. Automatic exclusion circuit for a key telephone set. 3,860,763, Cl. 179-18.0DA.

Sugimori, Shiro, to Nippon Kogaku K.K. Motor-driven film rewind device for a camera. 3,860,197, Cl. 242-201.000.

Sugiura, Akio; Okamoto, Atsutoshi; and Suzuki, Motoyoshi, to Nippondenso Co., Ltd. Interface circuit. 3,860,830, Cl. 307-253.000.

Sulkiewicz, Jan, to KM Insinooritoimisto Oy-KM Ingenjorsbyra Ab. Tubular transportation element. 3,859,682, Cl. 14-3.000.

Sullivan, Dennis W., to Parker-Hannifin Corporation. Hose construction. 3,860,040, Cl. 138-124.000.

Sulzer Brothers Ltd.: *See—*
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Hubler, Peter, 3,860,029.

Sumimoto, Toru: *See—*
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Sumitomi Electric Industries, Ltd.: *See—*
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Sumitomo Chemical Company, Limited: *See—*
Ishizumi, Kikuo; Mori, Kazuo; Okamoto, Tadashi; Akase, Takeshi; Izumi, Takahiro; Akatsu, Mitsuhiro; Kume, Yoshiharu; Inaba, Shigeho; and Yamamoto, Hisao, 3,860,575.

Summerfield, John M.: *See—*
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Sun Chemical Corporation: *See—*
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Sun Oil Company: *See—*
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Sundstrand Syracuse, Inc.: *See—*
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Superior Iron Works & Supply Company, Inc.: *See—*
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Superior Towbar Manufacturing Co., Inc.: *See—*
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Suthard, Robert A.: *See—*
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Suzuki, Yukio: *See—*
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Svenska Dataregister AB: *See—*
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Swain, Allan L.: *See—*
Tallent, Michael W.; Scaggs, Lee E.; Swain, Allan L.; Harrison, Ronnie M.; and Hendershot, William B., III, 3,860,952.

Swanson, Floyd R., Jr. Demolition device. 3,859,910, Cl. 100-100.000.

Swered, Paul: *See—*
Shema, Bernard F.; Brink, Robert H., Jr.; and Swered, Paul, 3,860,516.
Shema, Bernard F.; Brink, Robert H., Jr.; and Swered, Paul, 3,860,713.

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Syntex (U.S.A.) Inc.: *See—*
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Taguchi, Masahiko: *See—*
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Tague, Patrick W. Electrooptical-calibrated variable neutral density filter with split area control. 3,860,943, Cl. 354-295.000.

Takada, Shohei, to Hitachi, Ltd. Information selecting and displaying apparatus. 3,860,745, Cl. 178-5.600.

Takada, Takezo, to Takata Kojyo Co., Ltd. Vehicle safety belt system. 3,860,261, Cl. 280-150.0SB.

Takano, Kaoru: *See—*
Matsubayashi, Saburo; and Takano, Kaoru, 3,860,220.

Takaoka, Matsuo: *See—*
Tanaka, Yuji; Takaoka, Matsuo; and Gosho, Kazuhiro, 3,860,878.

Takase, Shinji; and Yamazi, Takahiko, to Nippon Oil Company, Limited. Method for preparing silica-alumina catalysts for the conversion of hydrocarbon. 3,860,532, Cl. 252-453.000.

Takata Kojyo Co., Ltd.: *See—*
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Takatori Machinery Works Ltd.: *See—*
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Takemura, Kenji: *See—*
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Takenaka, Shigeo; Idaka, Kazuhiko; and Sakamoto, Yuichi, to Tokyo Shibaura Electric Co., Ltd. Colour cathode ray tube with colour raster displacement correction. 3,860,850, Cl. 313-428.000.

Takeshita, Yasuo: *See—*
Kazaoka, Kenichi; Hirose, Kimiharu; Takeshita, Yasuo; and Matsumoto, Hisao, 3,860,260.

Takeuchi, Soji: *See—*
Higuchi, Noboru; Ogawa, Yutaka; and Takeuchi, Soji, 3,860,432.

Takeuchi, Takeshi, to Hochiki Corporation. Urgency announcing apparatus. 3,860,746, Cl. 178-5.600.

Talcott, Thomas D.: *See—*
Miner, Kenneth G.; Talcott, Thomas D.; Davidson, James B.; and Batdorf, David B., 3,860,008.

Tallent, Michael W.; Scaggs, Lee E.; Swain, Allan L.; Harrison, Ronnie M.; and Hendershot, William B., III, to Consolidated Video Systems, Inc. Video time base corrector. 3,860,952, Cl. 358-8.000.

Tamura, Kohzoh: *See—*
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Tamura, Yasumitsu; Murayama, Masao; Seto, Eisuke; Yoshimoto, Yoshihiko; and Wada, Hisayuki, to Nippon Shinyaku Co., Ltd. 3-Alkoxy-5-substituted phenylacetic acids. 3,860,640, Cl. 260-520.000.

Tanaka, Toshiki, to Nippon Chemical Works Co., Ltd. Methine compounds. 3,860,587, Cl. 260-240.100.

Tanaka, Yoshinori: *See—*
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Tanaka, Yuji; Takaoka, Matsuo; and Gosho, Kazuhiro, to Nippon Tsu Shin Kogyo K.K.; and TIE/Communications, Inc. Temperature compensation circuit for a multi-frequency receiver. 3,860,878, Cl. 329-136.000.
Tangen Drives, Inc.: *See—*
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Taniguchi, Masaharu: *See—*
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Tanner, Alistair Gilmour; and Wallace, James Tarleton, to Devro, Inc. Caramel-containing collagen sausage casing and smoked sausage. 3,860,728, Cl. 426-105.000.
Tape-Athon Corporation: *See—*
Ringstad, John E., 3,860,873.
Tappan Company, The: *See—*
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Tarney, Robert Edward; and Verbanc, John J., to du Pont de Nemours, E. I., and Company. Ethylene/c –c alpha-olefin elastomers having improved building tack. 3,860,505, Cl. 204-159.120.
Tarro, Richard E. Cosmetic selecting container. 3,860,015, Cl. 132-79.00G.
Tarui, Yasuo; Komiya, Yoshio; and Sakamoto, Tsunenori, to Agency of Industrial Science & Technology. Optical information storage device. 3,860,916, Cl. 340-173.0LS.
Tasaka, Katsuhiko: *See—*
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Tate, Jack F.; and Maddox, Jim, Jr., to Texaco Inc. Method for stimulating well production. 3,860,071, Cl. 166-307.000.
Tate, Jack F., to Texaco Inc. Method for oil recovery. 3,860,072, Cl. 166-308.000.
Taub, David: *See—*
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Tavares, Robert F.: *See—*
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Tavazzani, Carlo: *See—*
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Taylor, Charles W., to Minnesota Mining and Manufacturing Company. Lower water absorption dental restorative. 3,860,556, Cl. 260-42.520.
Taylor, Donald F.: *See—*
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Taylor, Glenn E. Universal tiedown device. 3,860,263, Cl. 280-179.00R.
Taylor, Herbert R. Golf putting aid. 3,860,247, Cl. 273-186.00C.
Teague, Loy P., to Texaco Inc. Apparatus for avoiding water pollution at an offshore drilling site. 3,860,019, Cl. 134-109.000.
Technica-Guss GmbH: *See—*
Krall, Heribert A.; and Maag, Helmut, 3,859,829.
Teeuwen, Lloyd M.: *See—*
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Telang, Yeshwant P.; and Uy, James C., to Ford Motor Company. Controlled porous coating for rotary engine side housing. 3,860,367, Cl. 418-178.000.
Teleflex Incorporated: *See—*
Perlman, Sheldon E.; and Ion, John C., 3,859,702.
Telefonaktiebolaget L M Ericsson: *See—*
Matzner, Eva; and Sternbeck, Olaf, 3,860,465.
Telek, Bela; and Skaper, Thomas, to Xerox Corporation. N-alkyl morpholine treatment of a selenium-containing photoconductive layer. 3,860,421, Cl. 96-1.500.
Temer, Don J.: *See—*
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Tennenhouse, Clifford C., to Wall Colmonoy Corporation. Cooling system for vacuum furnaces. 3,860,222, Cl. 266-5.00C.
Tepas, Joseph J., Jr.; and Sangster, Arlon G., to Olin Corporation. Apparatus for dissolving and dispensing soluble solid material. 3,860,394, Cl. 23-267.00E.
Teppo, Anna Maija: *See—*
Honkanen, Erkki Juhani; and Teppo, Anna Maija, 3,860,573.
Terakawa, Takashige; and Hidaka, Sadahiko, to Kabushikikaisha Tokyo Keiki. Slot antenna with flare. 3,860,933, Cl. 343-771.000.
Terashima, Osamu; and Okabayashi, Ikuo, to Chiyoda Chemical Engineering & Construction Co. Ltd. Flexible sand drain for soft ground and method for constructing the same in the soft ground. 3,859,798, Cl. 61-11.000.
Testore, Guido. Transmission system for driving wheels of heavy motor vehicles. 3,860,082, Cl. 180-24.110.
Tetreault, Joseph E.; and Winkler, Edward D., to Anderson Power Products, Inc. Explosion proof connector. 3,860,315, Cl. 339-89.00M.
Teva Middle East Pharmaceutical & Chemical Works Ltd.: *See—*
Schoenberg, Shlomo; and Yellin, Haim, 3,860,582.
Texaco Inc.: *See—*
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Workman, Wilton L.; and Martin, Billy M., 3,860,466.
Textron Inc.: *See—*
St. Clair, Theodore A., 3,859,855.
Teymourian, Jamshid: *See—*
Johnson, Paul Richard; Teymourian, Jamshid; Rothrock, Elmer Weyman; Kircik, Willis James; and Lange, Kenneth Wilson, 3,859,805.
Theissen, Hans: *See—*
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Thekdi, Arvind C.: *See—*
Hemsath, Klaus H.; Schmidt, Harry Dean; and Thekdi, Arvind C., 3,860,221.
Theodores, Peter, to Sudbury Engineering. Leg brace. 3,859,991, Cl. 128-80.00E.
Thermatool Corporation: *See—*
Rudd, Wallace C.; and Udall, Humfrey N., 3,860,778.
Thevenon, Marcel: *See—*
Borrel, Marcel; Mathais, Henri; and Thevenon, Marcel, 3,860,495.
Thierion, Michel J. L. Loading a container with layers of bottles. 3,859,772, Cl. 53-26.000.
Thomas, Alford Mitchell; and Kurath, Paul, to Abbott Laboratories. Tripeptide intermediate for making trh. 3,860,570, Cl. 260-112.500.
Thomas & Betts Corporation: *See—*
Troccoli, Arthur M., 3,860,741.
Thomas-CSF: *See—*
Auria, Luigi D.; and Huignard, Jean-Pierre, 3,860,917.
Thomas, David F., Jr.: *See—*
Hill, Paul R.; and Thomas, David F., Jr., 3,859,736.
Thomas, Herbert: *See—*
Wollweber, Hartmund; Flucke, Winfried; Schulz, Hans Peter; and Thomas, Herbert, 3,860,590.
Thomas, Joseph John; and Smith, William, to Johnson & Johnson. Intravenous needle assembly. 3,859,998, Cl. 128-214.400.
Thomas, William Ormond; and Harle, Cyril Dawson, to British Steel Corporation. Ingot moulds. 3,860,459, Cl. 148-138.000.
Thompson, Christopher Garth: *See—*
Manners-Smith, John; Thompson, Christopher Garth; and Tinning, Peter, 3,860,096.
Thompson, Larry G. Pill container and dispenser. 3,860,111, Cl. 206-534.000.
Thompson, Robert J.: *See—*
Basler, Wayne G.; and Thompson, Robert J., 3,860,406.
Thompson, William I.: *See—*
Benedict, Manson; Thompson, William I.; and Parrish, Robert L., 3,859,807.
Thomson-CSF: *See—*
Bouygues, Jean; and Gerard, Rene, 3,860,124.
Thomson, David P., to Chicago Swimming Pool Manufacturing Inc. Prefabricated swimming pools. 3,859,674, Cl. 4-172.190.
TIE/Communications, Inc.: *See—*
Klaiber, Gerhart F.; Villadsen, Ove; and Schwartz, Charles, 3,860,762.
Shinoi, Tsuyoshi; and Murakami, Toyoshige, 3,860,756.
Sudoh, Kengo; and Ichikawa, Mikihiro, 3,860,763.
Tanaka, Yuji; Takaoka, Matsuo; and Gosho, Kazuhiro, 3,860,878.
Tihanyi, Jeno, to Siemens Aktiengesellschaft. Production of thin layer complementary channel mos circuits. 3,859,716, Cl. 29-571.000.
Tillman, John C.: *See—*
Chambers, Harry A.; and Tillman, John C., 3,859,770.
Timesavers, Inc.: *See—*
Fair, Raymond G., Jr., 3,859,758.
Timex Corporation: *See—*
Wuthrich, Paul, 3,859,783.
Timmermans, Franz D. Method of producing composite bushings and bearings. 3,859,831, Cl. 72-68.000.
Tinning, Peter: *See—*
Manners-Smith, John; Thompson, Christopher Garth; and Tinning, Peter, 3,860,096.
Tobias, Philip E. Automatic light exposure device for the graphic arts. 3,860,341, Cl. 355-115.000.
Todt, Dean S. Electric trolling motor weed guard. 3,859,953, Cl. 115-42.000.
Toepfl, Rosemarie: *See—*
Abel, Heinz; Hostettler, Hans; Berger, Alfred; Toepfl, Rosemarie; and Maeder, Arthur, 3,860,540.
Tokyo Juki Kogyo Kabushiki Kaisha: *See—*
Nakamura, Shiroji, 3,859,940.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Mori, Masafumi, 3,860,766.
Takenaka, Shigeo; Idaka, Kazuhiko; and Sakamoto, Yuichi, 3,860,850.
Tsuneta, Asahide; and Harao, Norio, 3,860,753.
Tolochko, Leonid Vasilievich: *See—*
Karger, Mikhail Iosifovich; Tolochko, Leonid Vasilievich; and Yaroschuk, Petr Vladimirovich, 3,860,774.
Tomasello, Marianna. Urine container for urinalysis. 3,859,671, Cl. 4-110.000.
Tomita, Chuji: *See—*
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Tomson, Elmar Yanovich: *See—*
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Tomy Kogyo Co., Ltd.: *See—*
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Toppan Moore Business Forms Co. Ltd.: *See—*
Mitsunari, Tetsuya, 3,859,726.
Toray Industries, Inc.: *See—*
Minami, Muneyoshi; and Taniguchi, Masaharu, 3,860,559.
Okamoto, Miyoshi; Hikota, Toyoniko; and Shimizu, Kitao, 3,859,698.
Toussaint, Dietrich; and Meyer, Frank, to Vereinigte Flugtechnische Werke-Fokker Gesellschaft mit beschrankter Haftung. Envelope for underwater cable, drag ropes or the like. 3,859,949, Cl. 114-235.00F.
Towle, Jack Lewis: *See—*
Turrill, Frank Hollister; Squire, Lyle Eli; and Towle, Jack Lewis, 3,860,621.
Townsend, Wesley Peter, to Western Electric Company, Incorporated. Method of rendering a hydrophilic surface hydrophobic. 3,860,447, Cl. 117-169.00R.
Toyo Seikan Kaisha Limited: *See—*
Tsurumaru, Michiko; Matsubayashi, Hiroshi; Sano, Hiroki; Suzuki, Yukio; and Ueno, Hiroshi, 3,860,398.
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Uozumi, Sumio; and Hirosawa, Koichiro, 3,859,871.
Yamanaka, Teruo; Kato, Takayuki; Ozeki, Osamu; Sato, Kazuo; and Bito, Minoru, 3,860,923.
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Tramposch, Herbert, to Pitney-Bowes, Inc. Method of making printing disc. 3,859,712, Cl. 29-418.000.
Trane Company, The: *See—*
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Trebron Holdings Limited: *See—*
Hamy, Norbert, 3,859,923.
Trelease, Robert: *See—*
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Tripp, Robert W., to Inductosyn Corporation. Position-indicating system. 3,860,920, Cl. 340-347.0SY.
Troccoli, Arthur M., to Thomas & Betts Corporation. Stress cone. 3,860,741, Cl. 174-73.00R.
Troth, Dennis L.: *See—*
Anderson, Robert D.; and Troth, Dennis L., 3,859,787.
Troth, Harvey Graham: *See—*
Guillet, James Edwin; and Troth, Harvey Graham, 3,860,538.
TRW Inc.: *See—*
Chambers, Harry A.; and Tillman, John C., 3,859,770.
Tryon, Sager, to FMC Corporation. Process for the simultaneous preparation of metal salts of an alkyl ester of a sulfoalkoxycarboxylic acid and a sulfoalkoxyalkanol. 3,860,527, Cl. 252-182.000.
Tsou, Ivan H., to Ford Motor Company. Electrocoating bath of carboxylic resin from trimellitic anhydride and polyurethane polyol. 3,860,546, Cl. 260-29.2TN.
Tsuchiya, Takao, to Sony Corporation. Color synchronization control circuit with generation of color killer signal. 3,860,954, Cl. 358-25.000.
Tsukada, Syusei: *See—*
Katayama, Hajime; Tsukada, Syusei; Kitajima, Talayuki; and Kuge, Tsukasa, 3,859,691.
Tsuneta, Asahide; and Harao, Norio, to Tokyo Shibaura Electric Co., Ltd. Image receiving and image transmitting fiber optics cathode ray tube for facsimile transceiver. 3,860,753, Cl. 178-7.850.
Tsurumaru, Michiko; Matsubayashi, Hiroshi; Sano, Hiroki; Suzuki, Yukio; and Ueno, Hiroshi, to Toyo Seikan Kaisha Limited. Can produced from chromium-coated steel plate. 3,860,398, Cl. 29-195.000.
Tube Products Limited: *See—*
Bradshaw, Harry Osborne, 3,860,188.
Tuites, Richard C.: *See—*
Ponticello, Ignazio S.; Perry, Ernest J.; and Tuites, Richard C., 3,860,428.
Turley, James F. Frost heave-protected sleeve-connected shut-off valve. 3,860,024, Cl. 137-39.000.
Turner, David Lilley, to National Research Development Corporation. Transport systems. 3,859,924, Cl. 104-25.000.
Turner, Robert K.; and Rose, Edgar, to Outboard Marine Corporation. Fuel feed system for recycling fuel. 3,859,967, Cl. 123-73.00A.
Turrill, Frank Hollister; Squire, Lyle Eli; and Towle, Jack Lewis, to Chemetron Corporation. Method of recovery of a fuchsine salt. 3,860,621, Cl. 260-391.000.
Tuttle, Robert N.: *See—*
Herce, John A.; and Tuttle, Robert N., 3,860,070.
Tuvell, Melvin E.: *See—*
Dewitt, William J.; and Tuvell, Melvin E., 3,860,528.
Twaroch, Franz: *See—*
Herzog, Friedrich; and Twaroch, Franz, 3,860,813.
Tyau, Walter Fah Min, to International Telephone and Telegraph Corporation. Pulse discriminator to prevent contact bounce. 3,860,833, Cl. 307-247.00A.
Tyrolit-Schleifmittelwerke Swarovski K G.: *See—*
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Uchida, Teiji: *See—*
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Udall, Humfrey N.: *See—*
Rudd, Wallace C.; and Udall, Humfrey N., 3,860,778.
Ueda, Hirozo: *See—*
Ono, Yoshiaki; Yoneyama, Masakazu; Ueda, Hirozo; and Yamamoto, Nobuo, 3,860,425.
Ueda, Seiichi, to Hitachi, Ltd. Noise canceller circuit for television sync separator. 3,860,750, Cl. 178-7.30S.
Ueda, Tateki, to Pioneer Electronic Corporation. Plural tape recorder change-over mechanism for simultaneous or sequential operation. 3,860,963, Cl. 360-92.000.
Ueno, Hiroshi: *See—*
Tsurumaru, Michiko; Matsubayashi, Hiroshi; Sano, Hiroki; Suzuki, Yukio; and Ueno, Hiroshi, 3,860,398.
Uhlemayr, Albert; and Traitteur, Heinz, to Michael Huber Munchen. Printing ink binder. 3,860,670, Cl. 260-829.000.
Uhlmann, Lothar: *See—*
Geier, Karl-Heinz; Schmidt, Dietmar; and Uhlmann, Lothar, 3,860,915.
Umphrey, Ronald W.: *See—*
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Union Camp Corporation: *See—*
Barker, Richard G.; and Becker, Edward S., 3,860,479.
Union Carbide Corporation: *See—*
Hamling, Bernard H., 3,860,529.
McCain, James Herndon, Jr.; and Foster, Louis, 3,860,656.
Union Oil Company of California: *See—*
Young, Dean Arthur, 3,860,533.
United Aircraft Corporation: *See—*
Brown, Clyde O.; and Banas, Conrad M., 3,860,784.
Caruolo, Antonio B.; and Davis, Jack W., 3,860,889.
Cavicchi, Allen W.; and Ketting, Gabor T., 3,860,358.
Cheo, Bernard Ru-Shao; Kosowsky, Lester H.; Smith, Peter W.; and Soong, An-Hwa, 3,860,934.
Games, John E.; Casper, Clarence, Jr.; and Kupersmith, Lertram F., 3,860,877.
McLafferty, George H., 3,860,885.
United Kingdom Atomic Energy Authority: *See—*
Duncan, Allan George, 3,859,811.
United Merchants and Manufacturers, Inc.: *See—*
Ellis, Crawford M., 3,859,823.
Gregorian, Razmic S.; and Hoernle, Hans R., 3,860,469.
U.S. Baird Corporation, The: *See—*
Karsnak, George D., 3,859,838.
United States Borax & Chemical Corporation: *See—*
Nies, Nelson P.; and Hulbert, Richard W., 3,860,692.
United States Gypsum Company: *See—*
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United States of America
Army: *See—*
Guthrie, William D., 3,859,890.
Kaplan, Abner; and Dean, William J., 3,859,922.
Martin, Thomas E.; and Horvath, John C., 3,860,678.
Parks, Jack G., 3,860,869.
Rittenbach, Otto E., 3,860,760.
Sayles, David C., 3,860,462.
Sayles, David C., 3,860,463.
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Anderson, Norman G., 3,860,515.
Benedict, Manson; Thompson, William I.; and Parrish, Robert L., 3,859,807.
Gens, Theodore A., 3,860,691.
Gust, William H., 3,860,437.
Gust, William H.; Heckman, Richard A.; and Voreck, Wallace E., Jr., 3,860,445.
Husa, Ronald G., 3,860,890.
Nickerson, Robert F., 3,860,506.
Wheelock, Clifford W., 3,860,482.
Interior: *See—*
Hickman, Kenneth C. D., 3,860,494.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Wood, Gordon E. Simultaneous acquisition of tracking data from two stations. 3,860,921, Cl. 343-6.50R.
National Aeronautics and Space Administration: *See—*
DeLuca, John J., 3,859,714.
Gause, Raymond L., 3,859,840.
Hill, Paul R.; and Thomas, David F., Jr., 3,859,736.
Nola, Frank J., 3,860,858.
Orloff, Kenneth L.; Grant, George R.; and Gunter, William D., Jr., 3,860,342.
Sawyer, James T., 3,859,845.
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Falkowitz, Abe I., 3,860,550.
Headle, Herbert W., Jr., 3,860,791.
Johnson, Craig E.; and Henderson, Larry D., 3,860,477.
Lagally, Paul, 3,860,672.
Malone, James T.; Brennan, Richard L.; and Hallock, Donald D., 3,860,874.
Shernoff, Donald I.; and Simpson, James H., 3,860,311.
Speiser, Jeffrey M.; and Byram, George W., 3,860,892.

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Scientific Research and Development Office for Emergency Mangagment: *See—*
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U.S. Philips Corporation: *See—*
Buchner, Robert Bertold, 3,860,758.
Hamersma, Willem Antonius Maria, 3,860,851.
Prout, Brian John, 3,860,708.
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Schagen, Pieter; King, Hewson Nicholas Graham; and Washington, Derek, 3,860,849.
Van Der Hoek, Jan Lambertus, 3,860,896.
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United States Steel Corporation: *See—*
Abarotin, Eugene V.; and Wilshire, Robert A., Jr., 3,859,709.
Cohlmeyer, Stanley H.; Harrell, Wade H.; and Knepper, William A., 3,860,376.
Johnson, William R., 3,860,502.
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Pendergrast, Robert A., 3,860,023.
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Universal Instruments Corporation: *See—*
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Universal Machine Company, Inc.: *See—*
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University of Illinois Foundation: *See—*
Johnson, Roger L.; Ebeling, Frederick A.; and Parry, James H., 3,860,754.
University of Maryland, The: *See—*
Hochuli, Urs; and Haldemann, Paul R., 3,860,310.
Uno, Naoyuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Wind-up interlock for a single lens reflex camera. 3,860,939, Cl. 354-153.000.
Unterstenhofer, Gunther: *See—*
Stolzer, Claus; Hammann, Ingeborg; and Unterstenhofer, Gunther, 3,860,646.
Uozumi, Sumio; and Hirosawa, Koichiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Speed change gear device. 3,859,871, Cl. 74-761.000.
Upmeier, Hartmut, to Windmoller & Holscher. Apparatus for making, flattening and hauling-off blown tubular plastics film. 3,860,380, Cl. 425-326.00B.
Urbanosky, Harold J., to Schlumberger Technology Corporation. Methods and apparatus for testing earth formations. 3,859,851, Cl. 73-155.000.
Urich, Daniel M., to Eveleth Taconite Company. Apparatus for use in pelletizing ore. 3,860,224, Cl. 266-20.000.
USM Corporation: *See—*
Muhlbach, Anton, 3,859,912.
Muhlbach, Anton, 3,859,912.
Utzinger, Diethelm; and Kunz, Peter, to Mettler Instrumente AG. Electrical balance with taring means. 3,860,077, Cl. 177-165.000.
Uy, James C.: *See—*
Telang, Yeshwant P.; and Uy, James C., 3,860,367.
Valeri, Frank E.: *See—*
Vessio, Robert J.; Valeri, Frank E.; Leask, George M.; and Peterson, Richard W., 3,860,147.
Valukonis, Jonas: *See—*
Feustel, James R.; Hoyt, Kenneth L.; and Valukonis, Jonas, 3,860,258.
Vance, James C., Sr., to Gates Rubber Company, The. Endless belt making. 3,860,684, Cl. 264-157.000.
Van Der Burg, Willem Jacob, to Akzona Incorporated. Tetrahydroimidazo-dibenzo-oxazepines, thiazepines and-diazepines. 3,860,606, Cl. 260-309.700.
Van Der Hoek, Jan Lambertus, to U.S. Philips Corporation. Air inductive ballast. 3,860,896, Cl. 336-96.000.
Van Der Koogh, Hermanus Hendrik, to Industrieele Maatschaddij Zutphen B. V. Automatic air vent. 3,860,026, Cl. 137-202.000.
Vandiveer, Paul R.; and Young, Elbert Wayne. Current circuit terminal block adapter. 3,860,314, Cl. 339-18.00R.
Van Manen, Dick T.; and Buckley, Ronald D., to Voplex Corporation. Sink overflow. 3,859,675, Cl. 4-187.00R.
Vanmark Corporation: *See—*
Wallace, Joseph E., 3,859,821.
Van Steenhoven, Frank, to Westinghouse Electric Corporation. High output low brightness ventilated luminaire. 3,860,903, Cl. 240-47.000.
Vargiu, Silvio; Giovanni, Sesto S.; Pitzalis, Mario; and Crespolini, Giancarlo, to Societa 'Italiana Resine S.I.R. S.p.A. Process for the production of epoxy-novolak resins and products thereof. 3,860,561, Cl. 260-59.0EP.
Varian Associates: *See—*
Hiramatsu, Yukio, 3,860,891.
Vas Ltd.: *See—*
Owens, Robert C., Jr., 3,860,822.
Vasiliev, Atlant Anatolievich; Mescherov, Rakhim Ainudinovich; Murin, Boris Pavlovich; and Stavissky, Jury Yakovlevich. Pulsed neutron source. 3,860,828, Cl. 250-501.000.
Vater, Wulf: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,860,601.
Vaughn, Walter L.; Kottle, Sherman; and Symm, Richard H., to Dow Chemical Company, The. Process and composition for water proofing substrates. 3,860,441, Cl. 117-65.200.
Vavolotis, Andrew C. Locking chock. 3,859,947, Cl. 114-218.000.
Velsicol Chemical Corporation: *See—*
Krenzer, John, 3,860,593.
Krenzer, John; and Richter, Sidney B., 3,860,644.
Richter, Sidney B.; and Krenzer, John, 3,860,643.
Ventron Corporation: *See—*
Wade, Robert C., 3,860,622.
Verbanc, John J.: *See—*
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Vereinigte Flugtechnische Werke-Fokker Gesellschaft mit beschrankter Haftung: *See—*
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Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft: *See—*
Aschauer, Hans; and Steinmair, Karl, 3,860,781.
Hoyer, Otto, 3,860,061.
Versatec, Inc.: *See—*
Lloyd, William A., 3,859,960.
Vessio, Robert J.; Valeri, Frank E.; Leask, George M.; and Peterson, Richard W. Dental hygiene dispenser. 3,860,147, Cl. 222-96.000.
Victor Company of Japan, Ltd.: *See—*
Shinozaki, Takashi, 3,860,955.
Victor, Harold, to Elite Manufacturing Company Limited. Filing apparatus. 3,860,120, Cl. 211-58.000.
Vieregge, Gustav: *See—*
Jeuken, Josef; Vieregge, Gustav; and Massberg, Wolfgang, 3,859,830.
Vigeant, George Henry, deceased: *See—*
Kloth, James Albert; Parsons, Stuart L.; Zimmerman, John Aaron, Jr.; and Vigeant, George Henry, deceased, 3,860,739.
Vigeant, Mrs. George Henry, executrix: *See—*
Kloth, James Albert; Parsons, Stuart L.; Zimmerman, John Aaron, Jr.; and Vigeant, George Henry, deceased, 3,860,739.
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Krylov, Alexandr Iosifovich; Myshko, Vladimir Semenovich; Smirnov, Leonid Stepanovich; Maslennikov, Jury Ivanovich; Vikulov, Igor Makarovich; Gontarenko, Alexandr Nikolaevich; Korovyanko, Alexandr Dmitrievich; and Zaitsev, Valery Pavlovich, 3,859,824.
Villadsen, Ove: *See—*
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Vilter Manufacturing Corporation: *See—*
Grant, Whitney I., 3,859,814.
Viout, Andre; and Esanu, David, deceased (by Samama, Lydie Esther, administratrix), to Societe Anonyme dite: L'Oreal. Certain copolymers and their use in cosmetics. 3,860,700, Cl. 424-61.000.
Vlaschenko, Georgy Ivanovich: *See—*
Nesterov, Pavel Petrovich; and Vlaschenko, Georgy Ivanovich, 3,859,778.
Voegeli, Otto, to International Business Machines Corporation. Magnetoresistive read head assembly having matched elements for common mode rejection. 3,860,965, Cl. 360-113.000.
Volkswagenwerk Aktiengesellschaft: *See—*
Fiala, Ernst, 3,859,688.
Von Hoftsten, Carl Fredrik: *See—*
Josefsson, Erik Anders Ake; Johansson, Folke Kark Evald; Almqvist, Kurt Karl Axel; and Von Hoftsten, Carl Fredrik, 3,860,418.
Von Klenck, Jurgen, to Mannesmann Aktiengesellschaft. Waste disposal method and system. 3,859,933, Cl. 110-8.00R.
Voplex Corporation: *See—*
Van Manen, Dick T.; and Buckley, Ronald D., 3,859,675.
Voreck, Wallace E., Jr.: *See—*
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Vosper Thornycroft Limited: *See—*
Bingham, Alan Edgar, 3,860,084.
Vossen, John Louis, Jr., to RCA Corporation. Rf sputtering apparatus and method. 3,860,507, Cl. 204-192.000.
Vossos, Peter H.: *See—*
Payne, Charles C.; and Vossos, Peter H., 3,860,431.
Vourinen, Jouko; Ingman, Yrjo; Johansson, Matti; and Kurkinen, Martti, to Kymin Osakeyhtio-Kymmene Aktiebolag. A ductile iron and method of making it. 3,860,457, Cl. 148-15.000.
Vulliet, William G.; and Schuetzenduebel, Wolfram G., to Intelcon Rad Tech. Method to control NOX formation in fossil-fueled boiler furnaces. 3,860,384, Cl. 431-4.000.
Vysniauskas, Jonas K.: *See—*
Chow, Ling George; and Vysniauskas, Jonas K., 3,860,895.
Wada, Hisayuki: *See—*
Tamura, Yasumitsu; Murayama, Masao; Seto, Eisuke; Yoshimoto, Yoshihiko; and Wada, Hisayuki, 3,860,640.
Wade, Robert C., to Ventron Corporation. Organotitanate-borate complexes. 3,860,622, Cl. 260-429.500.
Wagner, George M., to Hooker Chemicals & Plastics Corporation. Flame retardant process for cellulosics. 3,860,439, Cl. 117-62.200.
Wagner, Gerhard. Answer device for an interrogation-answer system having time dependent differing codes and provision of special signal means. 3,860,922, Cl. 343-6.8LC.
Wahlgren, Lars Osten, to Sintab Swedinventor AB. Methods and plants for drying material in liquid solid, suspended or granulated form, e.g. blood-plasma, digested sludge, forage, fish, cereals, etc.. 3,859,734, Cl. 34-9.000.
Walker, Dale E., to Peabody Gordon-Piatt, Incorporated. Process using a combination, oil, gas, and/or solid burner. 3,859,935, Cl. 110-22.00A.

Walker, Jerry Lee; and Cornelius, Thomas Edward, III, to Calgon Corporation. Filming amine emulsions. 3,860,430, Cl. 106-14.000.
Walker, Thomas E.: *See—*
James, Frazier N., Sr.; and Walker, Thomas E., 3,860,118.
Wall Colmonoy Corporation: *See—*
Tennenhouse, Clifford C., 3,860,222.
Wallace, James Tarleton: *See—*
Tanner, Alistair Gilmour; and Wallace, James Tarleton, 3,860,728.
Wallace, John G.; and Kuzia, Paul H., to Synergistics, Inc. Magnetically sensible record and process of producing same. 3,860,796, Cl. 235-61.12M.
Wallace, Joseph E., to Vanmark Corporation. Flexible coupling. 3,859,821, Cl. 64-11.00R.
Walter George Enterprises, Inc.: *See—*
Bergman, Walter George, 3,860,305.
Walus, Richard L.; and Olson, Gary E., to Possis Corporation. Method of skin packaging and package resulting therefrom. 3,860,117, Cl. 206-461.000.
Walutes, Ronald L.: *See—*
James, Frazier N., Sr.; and Walker, Thomas E., 3,860,118.
Wang, William S., to Consolidated Controls Corporation. Latching assembly with magnetic locking. 3,860,277, Cl. 292-251.500.
Ward, Benjamin F., to Westvaco Corporation. Treatment of tall oil fatty acids. 3,860,569, Cl. 260-97.500.
Ward, Dennis H. Method for blow molding an article having a re-entrant portion. 3,860,683, Cl. 264-96.000.
Warkentin, Brian T., to Chocolate International, Inc. Chocolate powder. 3,860,730, Cl. 426-174.000.
Warkentin, Ulrich: *See—*
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Warner, Gifford D. Tanker integrity system. 3,859,944, Cl. 114-74.00R.
Warren Rapp Company, The: *See—*
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Waterman, Sherwood V.; and Humble, Roy F. Restraint for flexible conduits. 3,859,692, Cl. 24-73.00R.
Watkins, David Vaughan. Encapsulated components. 3,860,740, Cl. 174-52.0PE.
Watkins, Raymond L. Interlocking modules. 3,859,769, Cl. 52-588.000.
Watlington, Francis W., to United States of America, Navy. Strum noise reducing device. 3,860,899, Cl. 340-3.00T.
Watrous, Donald L., to General Electric Company. Latching circuitry in a circuit for sequentially firing photoflash lamps. 3,860,856, Cl. 317-80.000.
Watson, Doma A.: *See—*
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Watson, James M., to Cosden Oil & Chemical Company. Thermolysis of styrene oxide. 3,860,614, Cl. 260-340.900.
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Weatherford, Danny J. Oil slick skimmer. 3,860,519, Cl. 210-242.000.
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Weeks, Walter Ole, Jr.; and Wohnoutka, Thomas Stanley. Multifrequency sequential tone decoder. 3,860,913, Cl. 340-171.0PF.
Wegener, Harold William. Foldable packer. 3,860,254, Cl. 280-36.00R.
Weholt, Raymond L., to Blick Equipment Corporation. Portable combustion apparatus. 3,859,934, Cl. 110-19.000.
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Weiss, Franz. Bicycle frame. 3,860,265, Cl. 280-281.000.
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Wheelock, Clifford W., to United States of America, Atomic Energy Commission. Reactor reactivity control by coolant passage coating. 3,860,482, Cl. 176-22.000.
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Wiase, Harry, to Illinois Tool Works Inc. Vacuum operated sheet registration mechanism. 3,860,233, Cl. 271-239.000.
Wichman, Sven Hjalmar; and Debock, Luke Francois, to Preload Technology Inc. Balsa wood footing for lng tanks. 3,860,140, Cl. 220-18.000.
Wick, Richard; and Bestenreiner, Friedrich, to Agfa-Gevaert Aktiengesellschaft. Method and apparatus for recording and reading out holograms on black-and-white film. 3,860,950, Cl. 358-2.0RM.
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Wild, Ernst, to Stafa Control System AG. Shutter device. 3,860,055, Cl. 160-1.000.
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Willy, John, to Specialty Converters, Inc. Manufacture of foam filled sheet products. 3,860,371, Cl. 425-115.000.
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Wilson, Harold W. Process for preparation of acidic fertilizer containing slag. 3,860,409, Cl. 71-62.000.
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Wolfe, Clifford. Submersible camera housing and operating mechanism therefor. 3,860,937, Cl. 354-64.000.
Wollweber, Hartmund; Flucke, Winfried; Schulz, Hans Peter; and Thomas, Herbert, to Bayer Aktiengesellschaft. Derivatives of 2-(4-aminophenylimino)-thiazolidine and 4h-5,6-dihydro-1,3-thiazines. 3,860,590, Cl. 260-243.00R.
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Woodfill, William L., to Brunswick Corporation. Marine drive transom seal apparatus. 3,859,951, Cl. 115-11.000.
Woods, Walter. Musical apparatus. 3,860,876, Cl. 328-167.000.
Wootten, John A.; and Rives, George S., to Lear Siegler Inc. Medical apparatus and method for feeding and aspirating. 3,860,000, Cl. 128-230.000.
Wootton, Leslie William, to U.S. Philips Corporation. Method of treating vaginitis. 3,860,707, Cl. 424-180.000.
Worcester, Ben C., Jr.; and Watson, Doma A., to Johnson & Johnson. Preformed cross-laid fabric and method of manufacturing the same. 3,860,045, Cl. 139-383.00R.
Worden, Owen Winram. Cable splice housing. 3,860,743, Cl. 174-93.000.
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Wray, Gary Q.; and Holden, John C. Method for testing oil wells. 3,860,069, Cl. 166-264.000.
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Yamane, Akiyoshi. Process for producing digestible puree from the fruit containing stone cells with high viscosity maintained. 3,860,726, Cl. 426-52.000.
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Yariv, Amnon; and Armstrong, Desmond R., to California Institute of Technology. Travelling wave optical amplifier and oscillator. 3,860,880, Cl. 330-5.000.
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York, Daniel R. Safety guard for shaping tool. 3,859,950, Cl. 144-251.00A.
Yoshida, Chukichi, to Asahi Egger Company Inc. Apparatus for solidifying the yolk of hen's eggs. 3,859,981, Cl. 126-374.000.
Yoshida, Masaru; Nakase, Yoshiaki; and Ito, Akihiko, to Japan Atomic Energy Research Institute. Novel process for preparing oxymethylene polymer. 3,860,562, Cl. 260-67.0FP.
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Yu, Mason K., to General Motors Corporation. Diffuser for a centrifugal compressor. 3,860,360, Cl. 415-211.000.
yung, Michael A.; and Mar, Bob. Container and container-cap combination. 3,860,135, Cl. 215-213.000.
Zaitsev, Valery Pavlovich: *See—*
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Zanker, Fritz; and Mangold, Dietrich, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of isocyanates. 3,860,623, Cl. 260-453.00P.
Zelinski, Robert P.; and Naylor, Floyd E., to Phillips Petroleum Company. Capping and curing of mercaptoelechelic polymers. 3,860,566, Cl. 260-79.50R.
Zeman, David G. Tube locking structure. 3,860,268, Cl. 285-14.000.
Zengel, Hans Georg; and Bergfeld, Manfred, to Akzo N.V. Process for the production of thioglycolic acid, beta-mercaptopropionic acid or salts thereof. 3,860,641, Cl. 260-526.00S.
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Zenith Radio Corporation: *See—*
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Zerbola, Giorgio, to Riv-Skf Officine di Villar Perosa S.p.A. Method and device for grinding the end faces of cylindrical bodies, particularly of rollers for rolling bearings. 3,859,756, Cl. 51-118.000.
Zerbola, Giorgio, to SKF Industrial Trading and Development Company B.V. Rolling bearing with sheet metal rings and two rows of rolling bodies. 3,860,301, Cl. 308-183.000.
Ziegler, Karl, to Robert Bosch Photokino G.m.b.H. Mechanism for intermittently advancing film cinematographic apparatus or the like. 3,860,332, Cl. 352-194.000.
Zimin, Vladimir Afanasievich: *See—*
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Zimmer, Peter. Device for working, particularly printing of sheet materials. 3,859,916, Cl. 101-119.000.
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Zitelli, William E.; and Mandel, Alan F., to Westinghouse Electric Corporation. Digital data recorder. 3,860,914, Cl. 340-172.500.
Zobel, Siegfried; Spinnler, Rainer; Ehgartner, Gabriele; and Hennig, Fridolin, to Agfa-Gevaert Aktiengesellschaft. Photographic apparatus for use with percussively ignitable flash lamps. 3,860,938, Cl. 354-144.000.
Zoecon Corporation: *See—*
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF JANUARY, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Becka, Michael M.: *See*—
Kamborian, Jacob S. and Caris. Re. 28,299.

Blodgett Mfg. Co.: *See*—
Blodgett, Stewart B. Re. 28,303.

Blodgett, Stewart B., to Blodgett Mfg. Co. Dynamically compensated weighing scales. Re. 28,303, 1–14–75, Cl. 177—164.

Butler, Roger M., to Esso Research and Engineering Co. Selective conversion of normal paraffins. Re. 28,300, 1–14–75, Cl. 260—683.

Caris, Costa: *See*—
Kamborian, Jacob S. and Caris. Re. 28,299.

Esso Research and Engineering Co.: *See*—
Butler, Roger M. Re. 28,300.

Godley, Lisbeth N.: *See*—
Kamborian, Jacob S. and Caris. Re. 28,299.

Havel, Charles J. Hot isostatic pressing using a vitreous container. Re. 28,301, 1–14–75, Cl. 75—223.

Kamborian, Jacob S., deceased, by L. N. Godley, M. M. Becka, J. S. Kamborian, Jr., executors, and C. Caris; said Caris assignor to the Estate of said Kamborian. Method and mechanism for applying cement in the corner between an upper margin and an insole. Re. 28,299, 1–14–75, Cl. 12—142.

Kamborian, Jacob S., Jr.: *See*—
Kamborian, Jacob S. and Caris. Re. 28,299.

RCA Corp.: *See*—
Staras, Harold, and Shefer. Re. 28,302.

Shefer, Joshua: *See*—
Staras, Harold, and Shefer. Re. 28,302.

Staras, Harold, and J. Shefer, to RCA Corp. Harmonic radar detecting and ranging system and automotive vehicles. Re. 28,302, 1–14–75, Cl. 343—5.

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Balda-Werke, Photographische Gerate GmbH & Co. KG: *See*—
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Boeing Co., The: *See*—
Whitener, Philip C. 234,079.

Booth, Dwight A. Dental chair base. 234,071, 1–14–75, Cl. D6—194.

Carlee Corp.: *See*—
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Clark, Hile A., to Olinkraft, Inc. Carton partition unit. 234,075, 1–14–75, Cl. D9—99.

Columbia Broadcasting System, Inc.: *See*—
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Coumbs, Sam. Combination timber cruising and range pole. 234,098, 1–14–75, Cl. D88—1.

Dart Industries, Inc.: *See*—
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Dimiceli, Joseph W. Utility pole guy hook. 234,073, 1–14–75, Cl. D8—260.

Doyle, Edward J., and R. S. Waters, to Schick Inc. Towel heating appliance. 234,083, 1–14–75, Cl. D23—77.

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DESIGN PATENTS

6 : 234,066
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17 : 234,084
26 : 234,070

29 : 234,075
34 : 234,089
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36 : 234,097
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48 : 234,087
53 : 234,079
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U.S. DEPARTMENT OF COMMERCE
Frederick B. Dent, *Secretary*.

PATENT OFFICE
C. Marshall Dann, *Commissioner*